HAND HELD® PRODUCTS
a Welch Allyn® affiliate

CORDLESS SCANNING SYSTEM

SCANTEAM® 2070 BASE
IMAGETEAM™ 3870 LINEAR IMAGER
SCANTEAM® 5770 LASER

System Manual

Disclaimer

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Web Address: www.handheld.com

Statement of Agency Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class B Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Caution: Any changes or modifications made to this device that are not expressly approved by Hand Held Products may void the user's authority to operate the equipment.

Note: To maintain compliance with FCC Rules and Regulations, cables connected to this device must be shielded cables, in which the cable shield wire(s) have been grounded (tied) to the connector shell.

Canadian Notice

This equipment does not exceed the Class B limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

CDRH Laser Safety Statement - ST5770 Series Only

This product complies with US DHHS 21 CFR J Part 1040.10. This product is a CLASS II LASER PRODUCT with a maximum output of 1.0 mW at 670 nanometers and continuous wave.

EN 60825-1 Laser Safety Statement - ST5770 Series Only

This product is classified as a CLASS 2 LASER PRODUCT with a maximum output of 9.0 mW at 670 nanometers per EN 60825-1:1994, Issue 2, June 1997.

R&TTE Directive

The IMAGETEAM 3870, SCANTEAM 5770, and SCANTEAM 2070 are in conformity with all essential requirements of the R&TTE Directive (1999/5/EC). This equipment has been assessed to the following standards: ETS 300 328 TS 300 826 (November, 1997); EN 60950: 1992, Incl Amdt 1-4, 11

This product is marked with CE0168 signifying conformity with Class II product requirements specified in the R&TTE Directive.

The equipment is intended for use throughout the European Community, but its authorization for use in France is restricted as follows: PAN European Frequency Range: 2.402 - 2.480 GHz; Restricted Frequency Range for use in France: 2.448 - 2.480 GHz.

Regulatory and Safety Agency Approvals

Parameter	*Specification*
Electromagnetic Emissions/Immunity	
U.S.A.	FCC Part 15, Class B - Verified
Canada	SOR 88/475, Class B - Verified
Europe	EN 55022 (CISPR22) Class B ETS 300 826 Type Certified
Others	EMC 89/336/EEC EN 50082-1:1997, EN55024
Safety	
U.S.A./Canada	UL Listed, C22.2 No. 950/UL 1950
Australia	conforms to AS/NZS Standard N344
Europe	TÜV Rheinland GS Licensed, EN 60950 (IEC 950) (Scanner and Base only - not on battery)
RF Approvals	
U.S.A.	FCC Part 15.249 Certified
Australia	C-TIC
Canada	RSS 210 Certified
Europe	ETS 300 328 Certified
Singapore	Type Approval for Spread Spectrum System

The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive and the 73/23/EEC Low Voltage Directive.

For further information please contact:

Hand Held Products (UK) Ltd.
1st Floor
Dallam Court Dallam Lane
Warrington, Cheshire WA2 7LT
England

Hand Held Products shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

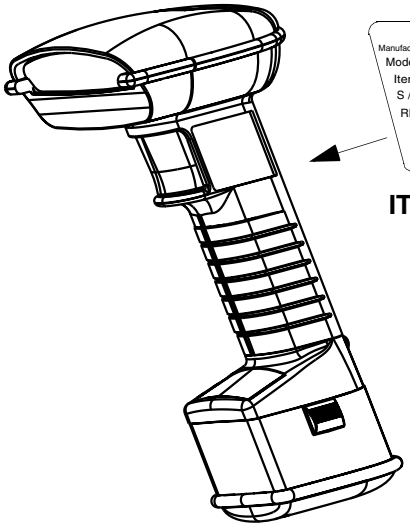
LR 89329

NRTL/C

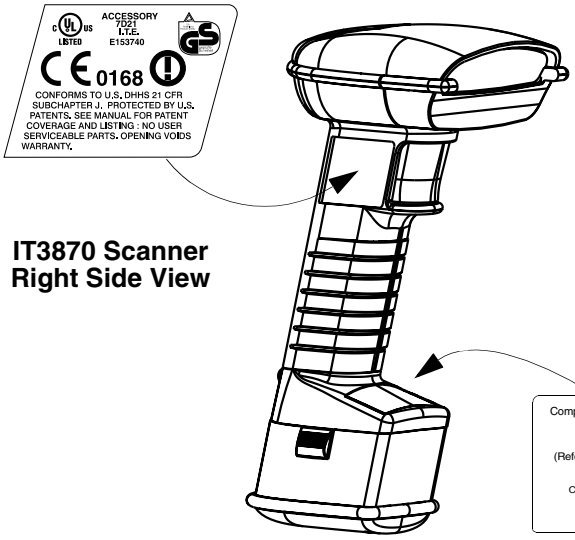
C.S.A. Statement

This product must be used with a certified Class 2 Power supply or be powered by a certified SELV (Safety Extra Low Voltage) output.

Enlarged Views of Regulatory Labels - IT3870

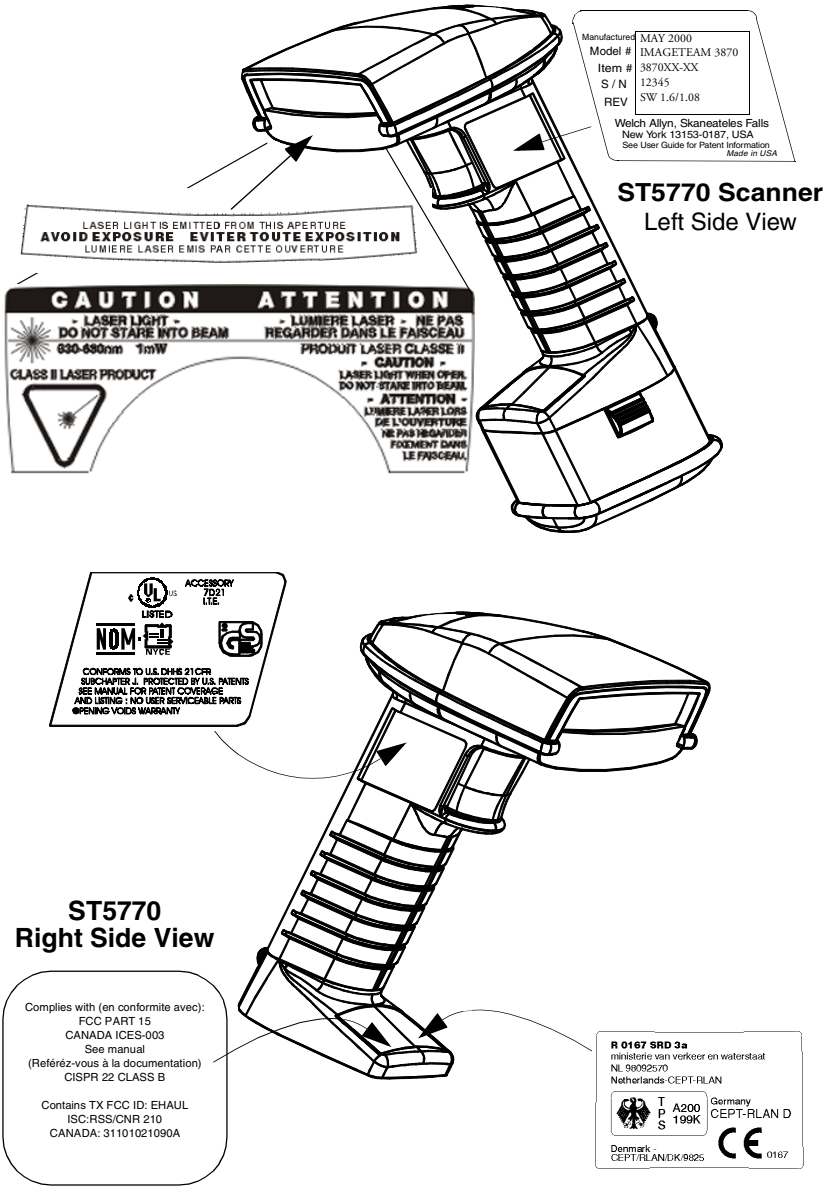


IT3870 Scanner
Left Side View


ACCESSORY
7D21
I.T.E.
E153740
0168
CONFORMS TO U.S. DHHS 21 CFR SUBCHAPTER J. PROTECTED BY U.S. PATENTS. SEE MANUAL FOR PATENT COVERAGE AND LISTING : NO USER SERVICEABLE PARTS. OPENING VOIDS WARRANTY.
Complies with (en conformite avec):
FCC PART 15
CANADA ICES-003
See manual
(Reférézvous à la documentation)
CISPR 22 CLASS B
Contains TX FCC ID: EHAUL
ISC: RSS/CNR 210
CANADA: 3110102109OA

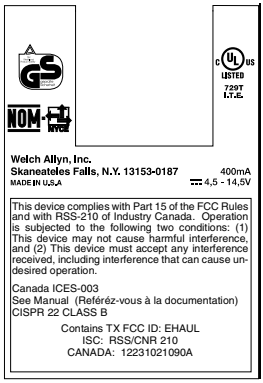
IT3870 Scanner
Right Side View

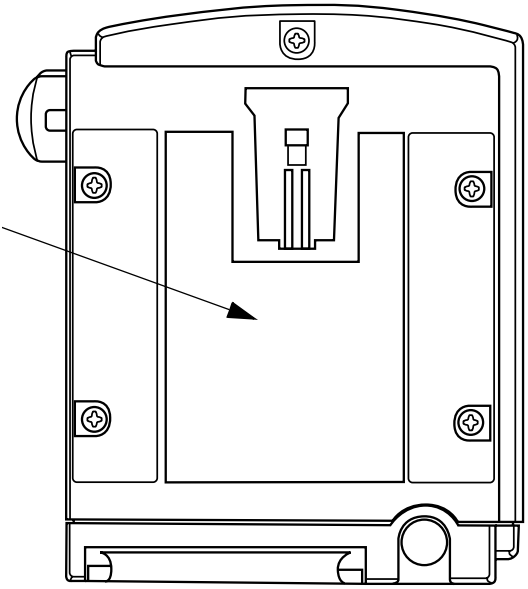
Enlarged Views of Regulatory Labels - ST5770


Manufactured MAY 2000
Model # IMAGETEAM 3870
Item # 3870XX-XX
S / N 12345
REV SW 1.6/1.08
Welch Allyn, Skaneateles Falls
New York 13153-0187, USA
See User Guide for Patent Information
Made in USA
ST5770 Scanner
Left Side View
LASER LIGHT IS EMITTED FROM THIS APERTURE
AVOID EXPOSURE EVITER TOUTE EXPOSITION
LUMIERE LASER EMIS PAR CETTE OUVERTURE
CAUTION ATTENTION
- LASER LIGHT - DO NOT STARE INTO BEAM
- LUMIERE LASER - NE PAS REGARDER DANS LE FAISCEAU
630-680nm 1mW
PRODUIT LASER CLASSE II
CLASS II LASER PRODUCT
- CAUTION - LASER LIGHT WHEN OPEN, DO NOT STARE INTO BEAM
- ATTENTION - L'LUMIERE LASER LORS DE L'OUVERTURE NE PAS REGARDER FIXEMENT DANS LE FAISCEAU
ACCESSORY 7D21 LITE
LISTED
NOM NYCE
CONFORMS TO U.S. DHHS 21CFR SUBCHAPTER J. PROTECTED BY U.S. PATENTS SEE MANUAL FOR PATENT COVERAGE AND LISTING : NO USER SERVICEABLE PARTS
OPENING VOIDS WARRANTY
ST5770
Right Side View
Complies with (en conformite avec):
FCC PART 15
CANADA ICES-003
See manual
(Reférez-vous à la documentation)
CISPR 22 CLASS B
Contains TX FCC ID: EHAUL
ISC:RSS/CNR 210
CANADA: 31101021090A
R 0167 SRD 3a
ministerie van verkeer en waterstaat
NL 98092570
Netherlands-CEPT-RLAN
T P S A200 199K
Germany
CEPT-RLAN D
Denmark -
CEPT/RLAN/DK/9825
0167

Enlarged Views of Regulatory Labels - ST2070

ST2070 Base - Bottom


c UL us
LISTED
729T
I.T.E.
NOM
Welch Allyn, Inc.
Skaneateles Falls, N.Y. 13153-0187
MADE IN U.S.A
400mA
4,5 - 14,5V
This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subjected to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that can cause undesired operation.
Canada ICES-003
See Manual (Référéz-vous à la documentation)
CISPR 22 CLASS B
Contains TX FCC ID: EHAUL
ISC: RSS/CNR 210
CANADA: 12231021090A



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1

Introduction and Installation

Introduction

The cordless scanning system consists of the SCANTEAM 2070 Base unit and at least one IMAGETEAM 3870 Cordless Linear Imager or SCANTEAM 5770 Cordless Laser Scanner. Up to nine scanners may be associated with one base. Each cordless scanner has a removable, rechargeable charge pack and provides real time decoding within a 50 foot (15m) to 100 foot (30m) radius of the base unit depending on the environment.

The cordless system is an economical, durable solution for a wide variety of portable data collection applications. The cordless system features:

- a tough, ergonomic thermoplastic housing for comfort and durability.
- recognition and decoding of the most popular, industry-standard bar code PDF417.
- scanner coverage of up to 7854 square feet (730 square meters).
- a wide range of interfaces that are compatible with many POS, keyboard wedge, wand and laser emulation, RS-232 terminals, and legacy decoders.
- visible and audible feedback for confirmation of a successful decode.
- a rechargeable battery designed to operate through a whole work day.

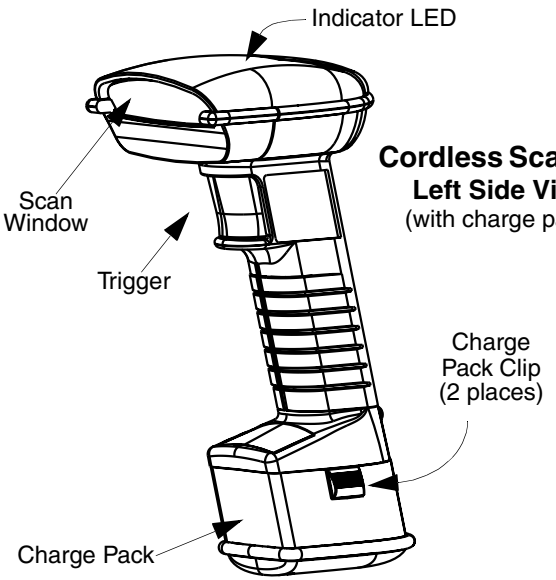
This manual contains information to help you set up, operate, and program the cordless system. Product specifications, connector pinouts, scan maps, a troubleshooting guide, and customer information are also provided.

The cordless system can be programmed for many communications parameters and input/output protocols compatible to the host, as well as advanced data editing and formatting. Programming is accomplished by using the single programming bar codes in this manual.

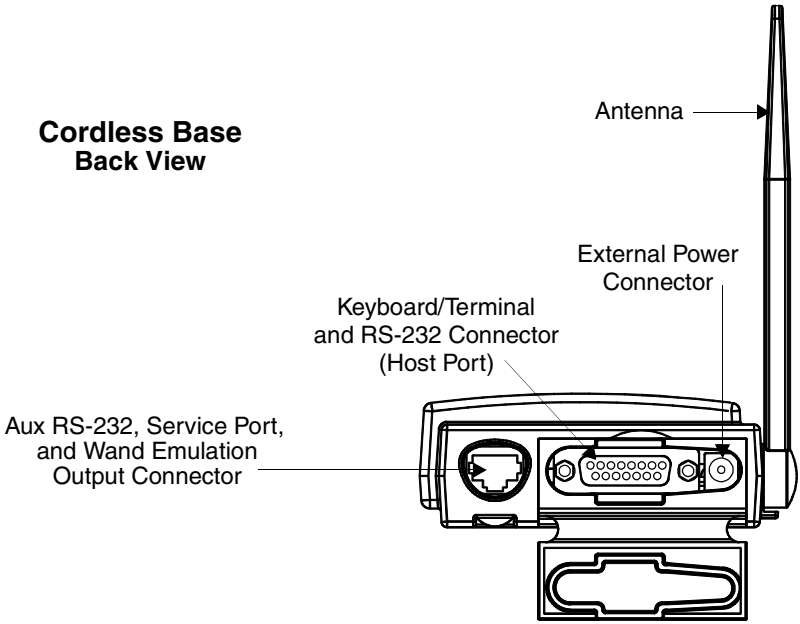
This section contains the following information:

- Cordless System Main Components
- Charge Pack and Charging Information
- Cordless System Set Up and Connection
- Beeper and LED Sequences and Meaning
- Basic Operation of the Cordless System
- Communication Between the Cordless System and the Host
- Accessories for the Cordless System

Cordless System: Main Components



Cordless Scanner
Left Side View
(with charge pack)

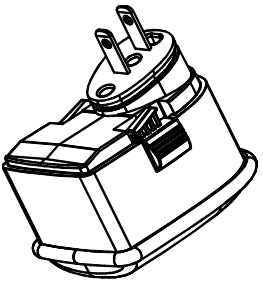

Antenna
External Power Connector
Keyboard/Terminal and RS-232 Connector (Host Port)
Aux RS-232, Service Port, and Wand Emulation Output Connector

Cordless Base
Back View

About the Charge Pack

(CLESS/NIMH/S and 34/5770/NIMH/S)

Power is supplied to the cordless scanner by a rechargeable charge pack that snaps onto the bottom of the scanner. Each scanner is shipped with a charge pack. *(See "Charge Pack Specifications (CLESS/NIMH/S and 34/5770/NIMH/S)" on page 7-5 for technical specifications.)*



Note: Order backup charge pack(s) or replacements from your distributor.

North American Charging Information

The charge pack is designed to plug into any two-prong North American AC power outlet for direct charging. You need no additional equipment and you can recharge the pack virtually anywhere.

Worldwide Charging Information

Since the charge pack is rated for both 120/240 V, 50 Hz/60Hz applications, it may be charged worldwide. A custom charge strip is available to accommodate the wide variety of electrical outlets internationally.

When the charge strip is used in 240 V applications, only use battery CLESS/NIMH/S and 34/5770/NIMH/S. Do not attempt to charge battery part numbers: 34/5770/NICAD, 34/5770/NIMH, 34/5770/NIMH/F, or 34/5770/NICAD/F at 240 V.

Charge Pack Recommendations

- Batteries are shipped uncharged and need to be conditioned for full capacity and longer life.
- To maintain the maximum charge capacity, batteries should be allowed to fully discharge prior to charging. It is recommended that you establish a process where a battery is used until it is fully discharged and fully charged before its next use.
- Avoid using the charge pack in extreme temperatures.
- Do not disassemble the charge pack. There are no user-serviceable parts in the charge pack.
- Avoid extended overcharging; do not leave the battery charging for more than two weeks.
- Periodically, about every 6 months, repeat the charge pack conditioning.

Conditioning the Charge Pack

- Batteries are shipped uncharged and need to be conditioned for full capacity and longer life.
- Charge the battery for 12 hours for the first two times to fully condition the battery. (Fully discharge in between each initial charge.)
- Fully discharge the charge pack on a periodic basis by leaving the charge pack attached to the scanner until the scanner no longer operates, about 24 hours. (Make sure all idle modes are disabled for this procedure -- see "Battery Conservation Mode" on page 2-15).

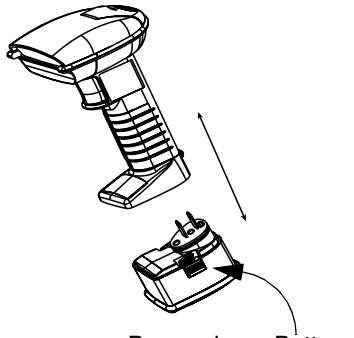
Charging Your Charge Pack

(CLESS/NIMH/S or 34/5770/NIMH/S)

Charge the charge pack by following the steps below:

1. Detach the charge pack from the bottom of the scanner. (See figure below)
2. Fully charge the battery. Plug the charge pack directly into any common 120 V AC outlet in North America. If outside North America, use the custom charge strip or adaptor.
3. The LED on the bottom of the charge pack blinks red temporarily as part of the charge initialization sequence. After initialization, the LED remains solid red while the battery is charging. The LED shows green when the battery is fully charged and ready to use.

Recharge Time: 6 hours at any voltage at 20°C (68°F).



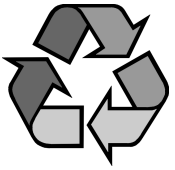
4. After the charge pack is fully charged, attach it to the cordless scanner by pressing the pack firmly (align the prongs on the pack with the mating receptacles) in the base of the scanner until the release buttons click, holding the pack firmly in place. (*When you attach a charged charge pack to the cordless scanner, you will hear a single beep.*)

5. If you haven't set up your Cordless System, turn to "Setting Up and Connecting the Cordless System" on page 1-6 for instructions.

6. If the scanner wasn't previously associated to the base, scan the association bar code on the top of the base. If the scanner was previously associated to a base, it will automatically re-associate. (The association process takes about ten seconds.)

When the charge pack needs recharging, the yellow LED on top of the scanner pulses in short, continuous blinks when the trigger is pulled. If the LED stops flashing when the temperature lowers or you do not use the charge pack for some time, you still need to charge the charge pack.

Proper Disposal of the Charge Pack



When the charge pack has reached the end of its useful life, the batteries should be disposed of by a qualified recycler or hazardous materials handler. Do not incinerate the charge pack or dispose of the charge pack with general waste materials. Contact the Product Service Department (see page 9-1) for recycling or disposal information.

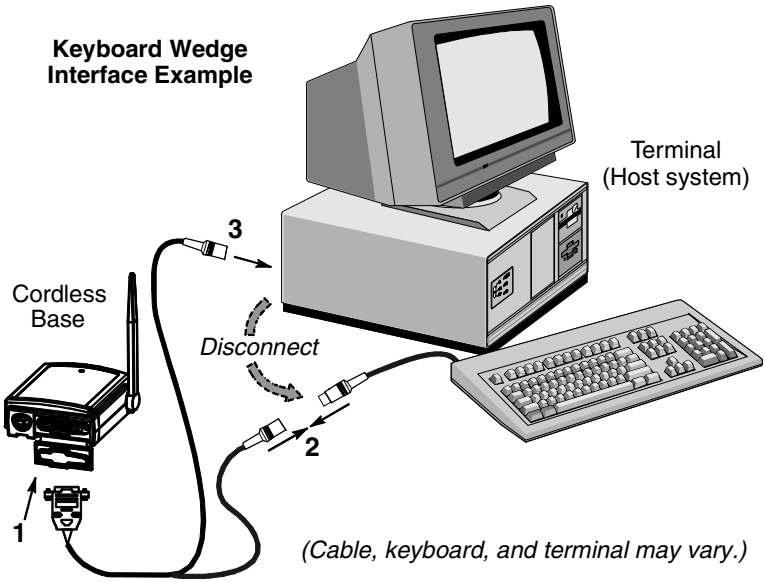
Setting Up and Connecting the Cordless System

Install the base and cordless scanner by following the steps shown below:

Important: *Make sure the cordless scanner's charge pack has been fully charged. See "Charging Your Charge Pack" on page 1-4 for charging instructions.*

Keyboard Wedge Interface

1. Turn off the power to the host system.
2. Connect the interface cable to the base and to the terminal/computer (steps 1-3, shown in the illustration below). Depending on your application, the interface cable you need may be different than the one shown.



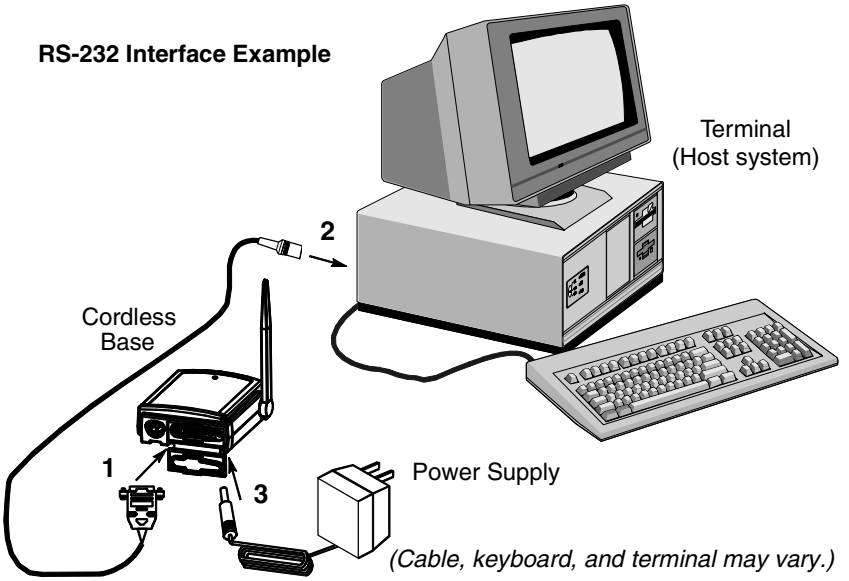
Note: For optimal coverage, place the base and its antenna as far away from other sources of RF interference, with a clear transmitting path to the scanner(s).

The base can be mounted on a wall or a ceiling. Try to place the base so that the antenna is in a vertical (straight up and down) position whenever possible. An extra Base Association Bar Code is provided in case the base is mounted where the label might be difficult to scan (the Association process is described on page 1-8).

RS-232 Interface

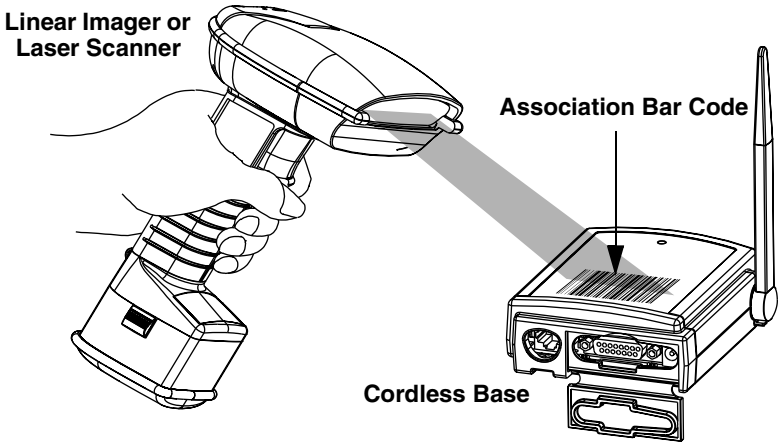
In an RS-232 configuration, connect your interface cable between the base unit and the host system (steps 1-3, shown in the illustration below). You also need to use an external power supply. Contact your distributor for more information on ordering power supplies or RS-232 cables, including a "Y" extension power cable to mount the base for best RF coverage.

RS-232 Interface Example



3. Turn on the power to the host system. Verify that the base is on; the green LED on top of the unit should be on. (The base does not have a beeper.)

4. Using the cordless scanner, scan the Association Bar Code (the bar code label on the top of the base) to link that scanner to the base.



Two quick beeps followed by clicking, then a single beep indicates a "good" association. The scanner is in communication with the base. If the scanner clicks for 30 seconds and signals an error (triple beep), it has not associated with the base.

Note: After association, if the charge pack is removed from the scanner and replaced, the scanner automatically reassociates to the base, if the base has power. In this case, the scanner beeps when a charged charge pack is installed, then beeps a second time after full association, typically five to ten seconds later.

5. After your cordless scanner has been associated with its base unit, program the system to work with your terminal or computer by scanning the Terminal Setup Codes. Use the Supported Terminal list (page 2-6) to scan your terminal's Terminal ID.

With Plug and Play programming, you scan *only* one bar code to program the cordless system to work with a designated interface, including any required prefixes and suffixes.

6. To determine if your cordless system is set up correctly, scan one of the sample bar codes in the back of this manual.

Connecting More Scanners to the System

Up to nine cordless scanners may be associated with one base unit. Add more cordless scanners to a base unit by following the steps shown below:

1. Make sure the cordless scanner's charge pack has been fully charged.
2. Scan the Association Bar Code (the bar code label on the top of the base) to link each scanner to the base.

The base stores a unique I.D. for each scanner (up to nine) to identify the scanner during data communication. Two beeps followed by clicking, then a single beep from the scanner indicates a "good" association. The base rejects a tenth cordless scanner trying to link to its network, sending the scanner an error command. (A rejected scanner beeps three times, indicating an unsuccessful association.)

Note: When you associate more scanners with the base, you don't have to program your cordless system to communicate with your terminal or computer if you've already completed step 5 on page 1-8.

Beeper and LED Sequences and Meaning - IT3870

The base contains a green LED that indicates the status of the unit and verifies its communication with the host system. The IT3870 contains a LED on the top of the unit to indicate its power up, communication, and charge pack status. Simply stated, red LED = error; green LED = success of any sort; yellow LED = device is working or busy. The unit's audible indicators have meaning as well -- 3 beeps = error; 2 beeps = menu change; 1 beep = all other successes; clicking/ ticking = progress; steady humming = PDF417 decoding

The table below lists the indication and cause of the LED illumination and beeps for the IT3870.

LED Indication	Beeper Indication	Cause
Normal Operation		
Steady Yellow	None	Working/busy
Yellow - blinking	None	Battery low
Steady yellow	Clicking	Indicates an association attempt
Steady yellow	Ticking/humming	Indicates PDF417 or MicroPDF417 decoding in process
Steady green	1 beep	Successful communication or association
Red, blinking	3 beeps	Failed communication or association
Menu Operation		
Steady green	Two beeps (high pitch, medium pitch	Successful menu change
Steady green	Two beeps (both high pitches)	Successful intermediate menu operation
Red, blinking	3 beeps (all 3 high pitches)	Unsuccessful menu change

Beeper and LED Sequences and Meaning - ST5770

The ST5770 contains a beeper and two LEDs on the top of the unit (green and yellow) to indicate its power up, communication, and charge pack status. The tables below list the indication and meaning of the beeps and LED illumination scanner.

ST5770 Scanner LED Indication

Sequence	Meaning
Green LED on	Trigger pulled, out of range
Green LED on, 2 seconds	Successful decode and communication
Green LED blinks, 2 seconds	Successful decode with unsuccessful communication, or unsuccessful clear to scanner
Green LED on, 2 seconds	Enter/exit programming mode, successful parameter change in programming mode
Green LED blinks, 2 seconds	Unsuccessful parameter change in programming mode
Yellow LED on	Scanning, trigger pulled (in or out of range)
Yellow LED blinks	Low battery (trigger pulled)

ST5770 Scanner Beep Indication

Sequence	Meaning
No beep	No scanning, scanning, or low battery (trigger pulled)
1 beep	Successful decode and communication
Clicking, then1 beep	Successful reassociation
Clicking only	Unsuccessful reassociation
2 beeps, clicks, then1 beep	Successful association to base
3 beeps - same pitch	Unsuccessful association to base (10th scanner), out of range, or no network.
3 beeps - 2 high and 1 low pitch	Enter/exit programming mode or successful association to base. Successful or unsuccessful parameter change in programming mode.
4 beeps - low, high, low, high pitch	Communication error: Successful decode with possible unsuccessful communication to base. Check host to determine if data arrived properly.

LED Sequences and Meaning - ST2070

The base contains a green LED that indicates the status of the unit and verifies its communication with the host system.

ST2070 Base LED Indication

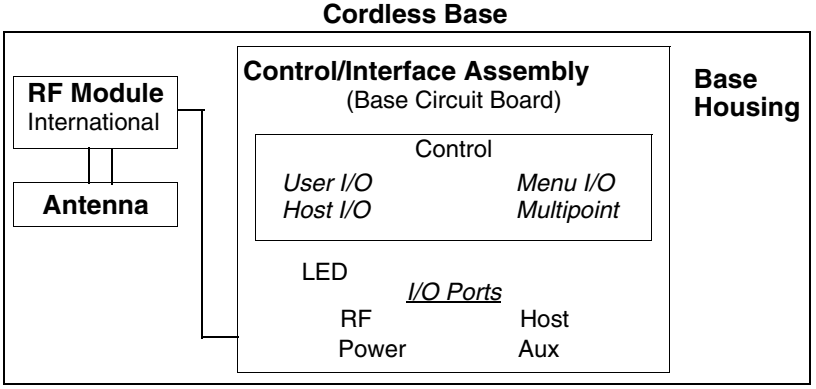
Sequence	Meaning
LED on continuously	Power on, system idle
LED blinks, long duration	Power on, diagnostic error
LED blinks, short duration	Receiving data from scanner, host, or aux port
LED blinks, four long pulses	Communication error detected

Basic Operation of the Cordless System

The following system block diagrams illustrate the basic operating components of the cordless system.

Cordless Base

The cordless base provides the link between the cordless scanner and the host system. The base contains a control/interface assembly and an RF communication module. The RF communication module performs the data exchange between the cordless scanner and the control/interface assembly. The control assembly coordinates the central interface activities including: transmitting/receiving commands and data to/from the host system, performing software activities (parameter menuing, visual indicator support, power-on diagnostics), and data translation required for the host system.



RF (Radio Frequency) Module Operation

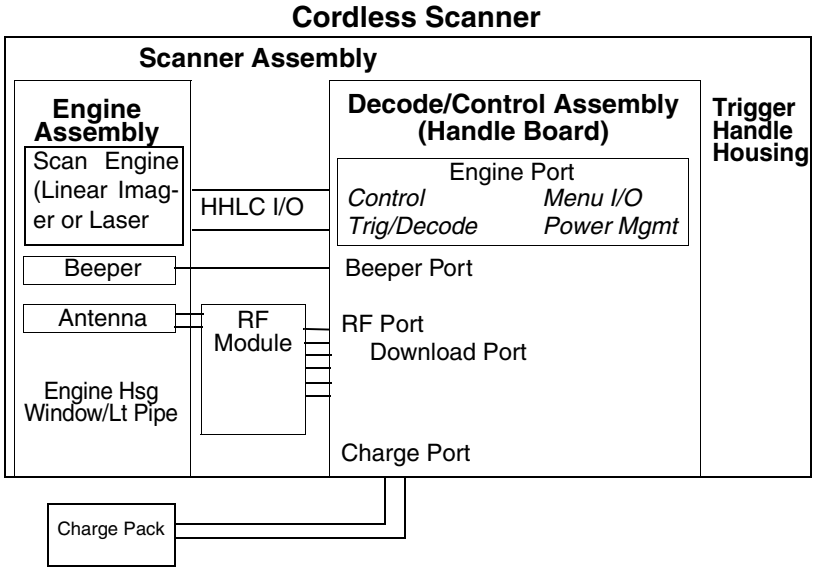
The cordless system uses a state-of-the-art two-way 2.4 GHz frequency-hopping spread spectrum radio to transmit and receive data between the scanner and the base. Designed for point-to-point and multipoint-to-single point applications, the radio transmits data at a rate of 1 megabit per second (Mbps). The radio operates using a license free ISM band, which sends relatively small data packets at a fast data rate over a radio signal with randomly changing frequencies, makes the cordless system highly responsive to a wide variety of data collection applications and resistant to noisy RF environments.

The RF radio used in the cordless system has been tested and approved as complying with the two leading standards-setting organizations that serve as regulatory models for compliance in most countries. In North America, the radio is approved under the standards in FCC B Part 15.249 regulations and, in Europe, under the standards in ETS 300 328 regulations.

Cordless Scanner

The cordless scanner enables fast and accurate bar code scanning using a non-contact linear imager or laser input engine. The scanner maintains radio communication with the base unit from 50 feet (15m) to 100 feet (30m) depending on the environment.

The scanner is comprised of a linear imager or laser scan engine, a decode/control assembly, and an RF communication module. The scan engine performs the bar code image illumination and sensing. The decode/control assembly coordinates the central communication activities including: capturing and decoding the bar code image data, performing software activities (parameter menuing, visual indicator support, low battery indication), and data translation required for the host system. The RF communication module performs the data exchange between the scanner and the base.



System Conditions

The components of the cordless system interact in specific ways as you associate one or more scanners to a base, as you move a scanner out of range, bring a scanner back in range, replace a scanner charge pack, or swap scanners between two cordless systems. The following information explains the cordless system operating conditions.

Association Process

After you scan the association label, the base synchronizes radio parameters and the work group parameter table in the scanner. The work group table is uploaded during the clicking sequence. Two beeps, clicking, then a single beep indicates the process is complete. The base blinks while it is sending the table to the scanner. Until the table is uploaded, scanning and data transmission is interrupted. If the base is off or not working properly, the scanner emits an error (triple) beep after trying for 30 seconds to associate to the base.

The work group table is also uploaded any time the base believes a previously associated scanner wishes to join the network. A scanner always tries to join the last base it was associated to, even if the scanner has been without power for several days. The base allows a scanner to associate as long as there are fewer than nine scanners associated to the base.

Scanner is Out of Range

The cordless scanner is always in communication with its base, even when it is not transmitting bar code data. Whenever the scanner can't communicate with the base for a three second interval, it is out of range. If the trigger is pulled while the scanner is out of range, the red LED illuminates on the IT3870 and the green and yellow LEDs illuminate on the ST5770. When you scan a bar code, the scanner issues 3 beeps and does not try to send data to the base.

Note: While the scanner is out of range, it consumes more power searching for the base continuously. To conserve battery power, store the scanner with the charge pack removed, or program it for Battery Conservation mode (see page 2-15).

Scanner is Moved Back Into Range

The scanner silently rejoins (no beep after connecting and synchronizing with the base) if the scanner has not been reset (charge pack disconnected and reconnected), no menu codes have been scanned by other scanners in the work group, and the base has not been reset (see Base Reset Conditions, next page). Any one of these three conditions can cause the scanner to go through a reassociation process (definition on page 1-16) when it is moved back in range. If the scanner reassociates, you will hear a single beep when the reassociation process (uploading of the parameter table) is complete.

If you believe you are in range and are still hearing a triple (error) beep, you may have been removed from the base's network. This could happen if the scanner loses power or goes out of range for three seconds. Try scanning the association label or reset the scanner by removing and reinserting the charge pack.

Replacing Charge Pack While Associated

When you insert the charge pack, the scanner beeps, followed by clicking. During this period the work group parameter table is uploaded to the scanner from the base. Scanning and data transmission is interrupted. When the scanner emits a second beep, you may scan again. If you don't receive a second beep, the table was not transferred successfully either because the scanner was out of range or all of the data was not received. Scan the association label again.

Moving Scanners From One Base to Another

You may transfer a scanner from one base to another simply by scanning a new base association label. A scanner can only be associated to one base at a time. Once a scanner has been associated to a base, it tries to stay associated to that base until a new base association label has been scanned. The new base adds a scanner to its association list as long as fewer than nine scanners are in its network. If a base has nine scanners in its network, you need to disassociate one scanner before adding another (see next section).

Swapping Scanners Between Two Systems with Nine Scanners on Each

You may use the Remove Scanner Selection (page 4-3) to disassociate any scanner. Add a new scanner by scanning the association label with the new scanner. If you cannot scan the disassociation label because the scanner you are trying to disassociate was damaged, remove power from that scanner and it automatically disassociates in approximately three seconds.

Glossary

Rejoin

Rejoin is when the scanner goes out of range and then comes back in range. The scanner silently rejoins (no beep after connecting and synchronizing with the base) if the scanner has not been reset (charge pack disconnected and reconnected), no menu codes have been scanned by other scanners in the work group, and the base has not been reset.

Base Reset Conditions

The base resets when base power is lost or when a diagnostic problem is sensed. In either case, the scanners automatically reassociate if they are within range.

Reassociation

The process of uploading the work group parameter table from the base is called "reassociation." During reassociation, the scanner clicks, then beeps once. Reassociation is done automatically, without having to scan an association label.

Association List

The base keeps an association list of up to nine entries. This list maintains the associated scanners' radio serial numbers and dynamic addresses. New dynamic addresses are assigned to the scanners each time a base reset occurs. This helps the cordless system track the status of the different scanners in its network during the association and reassociation process.

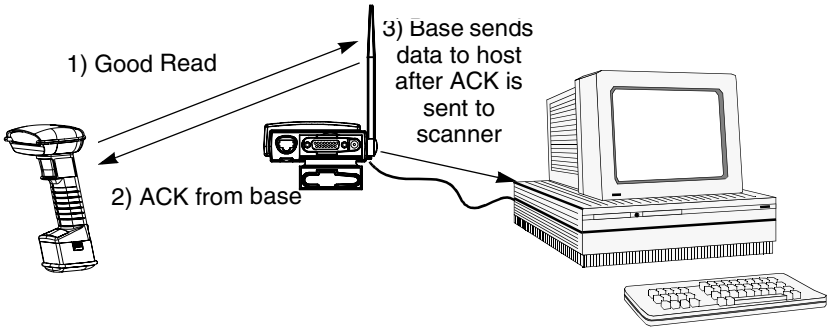
Communication Between the Cordless System and the Host

The cordless scanner provides immediate feedback in the form of a "good read" indication (a green LED on the scanner and an audible beep) after a bar code is scanned correctly and the base has acknowledged receiving the data. This is possible since the cordless system provides two-way communication between the scanner and the base.

When data is scanned, the data is sent to the host system via the base unit. Confirmation from the host system or the base indicates that the data sent was received by the host. The cordless scanner recognizes two forms of host confirmation: data acknowledgement (ACK) from the base unit or an “ACK” from the host system. If it cannot be determined that the data has been properly sent to the host system, the scanner issues an error indication. You must then check to see if the scanned data was received by the host system.

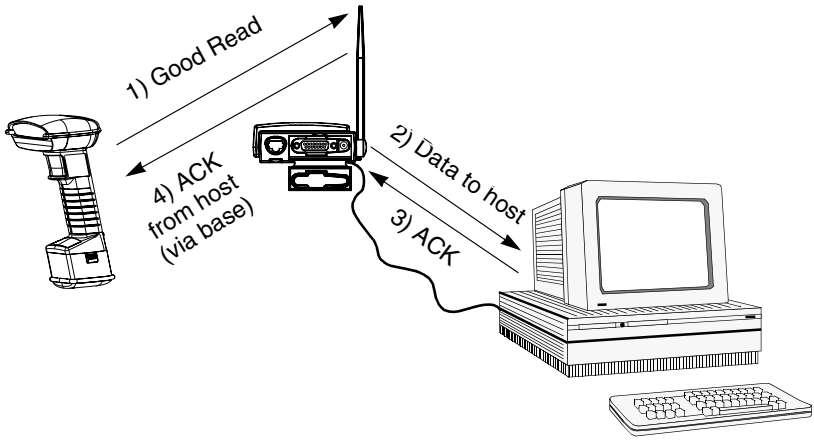
Acknowledgement from the Base

If the cordless system is configured for a keyboard wedge host interface, a signal (ACK) is sent from the base confirming that the data was received and is being sent on to the host system. (Since keyboard wedge interfaces cannot provide bi-directional communications, they do not permit host confirmation.)



Acknowledgement from the Host

Host system confirmation may be implemented with a bi-directional interface like RS-232. In this configuration, when the base unit receives the scanned data from the scanner and forwards it to the host, the cordless system waits for a signal from the host that it received the data. (For information on enabling this feature and using Host Escape commands, see “Host ACK Selection” on page 3-6).



Auxiliary Port

The Auxiliary (Aux) Port of the ST2070 is a bi-directional RS-232 port. When the Aux Port is configured as the interface (either using the Plug and Play RS-232 code or terminal ID = 000), the Aux Port is set up to be an RS-232 output port.

For all other interfaces, the Aux Port is available as an RS-232 input port. Peripheral devices can send data into the Aux Port, and the data is automatically sent out the main port to the host system.

Note: The Auxiliary Port cannot be used as an input when the base is configured for the following interfaces: Non-Decoded Laser Emulation (HHLC), wand emulation, and terminal ID = 000 (Aux Port RS-232 output).

Aux Port as an RS-232 Output Port

When the auxiliary port is configured as an output port, use the Auxiliary Port Protocol section (page 3-11 - page 3-13) to configure baud rate, parity, data bits, stop bits, and flow control. To change outgoing data prefix/suffixes, set up data formatting, and change symbology selections, use the programming selections in Chapter 4.

Aux Port as an RS-232 Input Port

When the auxiliary port is configured as an input port, incoming messages can be passed on to the host system “as is” or they can be manipulated by the base prior to sending to the host system. This manipulation may include attaching prefixes/suffixes to the message and/or data formatting the message.

In order for the base unit to correctly receive a message into the Aux Port, it is recommended that the incoming message be “framed” by known start and stop characters. These characters are attached to the message by the input peripheral, and the base is then programmed to look for these characters. The base unit is then able to recognize the beginning and end of a message, eliminating the possibility of partial messages being sent to the host system. Use the Data Character Selection bar codes (page 3-16) to program these “framing” characters.

The Auxiliary Protocol section (page 3-11 - page 3-13) is used to configure baud rate, parity, data bits, stop bits and flow control to match the peripheral protocol settings.

Accessories for the Cordless System

Several accessories are available for the cordless system. Contact your distributor for more information or to order accessories.

Charge Packs (CLESS/NIMH/S or 34/5770/NIMH/S)

The charge pack for the cordless scanner is a rechargeable Nickel Metal Hydride (NiMH) pack that, when fully charged, provides over 18,000 scans or 25 hours of continuous use. The unique design of the battery allows the charge pack to be directly charged in a two-prong wall outlet commonly used in North America.

The charge pack may be charged anywhere in the world through a universal charge strip to physically adapt to the various power plug and socket configurations.

Each scanner is shipped with one charge pack. Order a back up charge pack or a replacement charge pack separately.

Charge Strips

To charge more than one charge pack at one time, charge strips are available. The charge strips are offered in two or six outlet configurations and may be conveniently wall mounted or placed on flat surfaces. The charge strip uses a standard PC (IEC 320) grounded power cord between the charge strip and the electrical AC outlet.

Note: International versions of the power cords are provided by Hand Held Products' country partners or may be purchased from your local PC supplier. Hand Held Products does not supply these power cords.

Belt Holster

The belt holster holds the cordless scanner when not in use. The belt holster consists of a foam covered wire frame clasped to an adjustable nylon web belt designed to be worn around the waist.

Wall Mount Kit (Standard)

The standard wall mount holder stores the cordless scanner on a vertical surface for convenient access. The scanner easily slides between two rubberized fingers that hold the scanner when it is not in use.

Wall Mount Kit (Industrial)

Similar to the standard wall mount holder, the rubberized fingers on the industrial wall mount holder are smaller to maintain a firm grasp on the scanner under jolting and jarring conditions, such as those expected in fork lift applications.

Head Cover

The head cover features a "D" ring to attach to a tool balancer to suspend the scanner rather than putting it down.

Base Wall Mount Bracket

For applications where the ST2070 base needs to be firmly mounted to a wall. The bracket slides into the molded feature on the back side of the base.

Visual Menu™

Visual Menu is a software configuration tool that provides the ability to configure the cordless system by connecting the base unit to the COM port of a PC. Visual Menu allows you to download firmware upgrades, change programmed parameters, and create and print programming bar codes.

Introduction

Use this section to program the cordless system to work with your terminal or computer (host system).

This programming section contains the following menu selections:

- Plug and Play
- Terminal Interface
- Country Code
- Keyboard
- Output Delays
- Wand Emulation
- Power Settings
- Reset Factory Settings and Status Check

All operating parameters are stored in nonvolatile memory resident in the cordless system, where they are permanently retained in the event of a power interruption. When you receive your cordless system, certain operating parameters have already been set. These are the factory defaults, indicated by an asterisk (*) on the programming pages (beneath the default programming bar code). Default Charts that list all the factory settings may be found near the end of this System Manual.

A Programming Chart (found on the inside back cover of this manual) contains alphanumeric bar codes for setting additional programming options, such as the digits representing Symbology Message Length. The chart explains how and when to use the alphanumeric bar codes.

A Sample Bar Codes pages (located near the back of this manual) provides bar code symbols you may scan to verify that your cordless system has been programmed correctly and is communicating with your host system.

Plug and Play Selections

Note: Plug and Play menu codes will default all settings before programming the interface.

Industrial Interface: IBM PC

<Factory Default>

IBM PC AT and Compatibles Interface
(also PS/2 30-286, 50, 55SX, 60, 70, 70-061, 70-121, 80)

Note: The bar code above also programs a CR (carriage return) suffix.

Industrial Interface, Aux Port: RS-232

RS-232 Interface

Note: The bar code above also programs the following parameters:

Programmable Option	***Setting***
Baud Rate	*38,400 bps*
Parity	*None*
Data Format	*8 data bits, 1 stop bit*
Prefix	*None*
Suffix	*CR*

IBM 468X/9X Ports 5B, 9B, and 17 Interface

Scan one of the following “Plug and Play” codes to program the interface for IBM 4683 Port 5B, 9B, or 17.

Note: When using any of the IBM 4683 interfaces, the maximum allowable data rate into the base aux port is 9600 baud.

IBM 468X/9X Port 5B Interface

IBM 468X/9X Port 9B HHBCR-1 Interface

IBM 468X/9X Port 9B HHBCR-2 Interface

IBM 468X/9X Port 17 Interface

Industrial Interface, Aux Port: Wand Emulation Black High

Wand Emulation (Code 39 Format) Interface

Wand Emulation (Same Code Format) Interface
Supports Code 39, UPC, EAN, Code 128, Interleaved 2 of 5, and Codabar. All other codes are output as Code 39.

Note: The two bar codes above also program the following parameters:

Programmable Option	***Setting***
Transmission Rate	*25 inches per second*
Output Polarity	*Black High*

Industrial Interface, Aux Port: Wand Emulation White High

Wand Emulation (Code 39 Format) Interface

Wand Emulation (Same Code Format) Interface
Supports Code 39, UPC, EAN, Code 128, Interleaved 2 of 5, and Codabar. All other codes are output as Code 39.

Note: The two bar codes above also program the following parameters:

Programmable Option	***Setting***
Transmission Rate	*25 inches per second*
Output Polarity	*White High*

Non Decoded Laser Emulation (HHLC)

Use HHLC when connecting to a secondary terminal with integral decoding. This setting also sets the transmission rate to 37 scans per second and polarity to white high.

Non Decoded Laser Emulation

Terminal Interface Selections

If your terminal is not one of the Plug and Play options, you must program your terminal's interface using one of the "Terminal I.D." numbers listed below. To program your terminal to the scanner, scan the Program Terminal Interface bar code below, then scan the appropriate Terminal I.D. code and ***Save*** from the Programming Chart on the inside back cover.

Program Terminal Interface

*Note: The factory default Terminal I.D. is **003**.*

Supported Terminals

Terminal	Model(s)	Terminal I.D.
Bull	BDS-7 Honeywell (HDS-7)	035
DEC	PC433 SE (Portable PC)	003*
DEC	VT-220, 320, 330, 340, 420	004
DEC	VT-510, 520, 525 (PC Style)	005
DEC	VT-510, 520, 525 (DEC Style LK411)	104
DELL	Latitude (Portable PC)	003*
DTK	486 SLC (Portable PC)	003*
Falco	5220	047
Fujitsu	Point 510	003*
Fujitsu	Point 1600	003*
Fujitsu	Stylistic (Portable PC)	003*
HHLC		**
IBM	PC XT	001
IBM	PS/2 25, 30, 77DX2	002
IBM	AT, PS/2 30-286, 50, 55SX, 60, 70, 70-061, 70-121, 80	003
IBM	AT Compatibles Keyboard Emulation (Non-wedge)	003
IBM	Thinkpad	003*
IBM 102 Key	3151, 3161, 3162, 3163, 3179, 3191, 3192, 3194, 3196, 3197, 3471, 3472, 3476, 3477, 3482, 3486, 3488	006
IBM 122 Key	3179-1, 3191, 3192, 3471, 3472, 3194	007
IBM 122 Key	3196, 3197, 3476, 3477, 3482, 3486, 3488	008
IDEAssociates	276, 277, 486, 487, 587	071

Supported Terminals (Continued)

Terminal	Model(s)	Terminal I.D.
Lee Data	IIS	007
Link ANSII	MC-3+, MC-5	015
Link ASCII	MC-3+, MC-5	014
Link Enhanced PC	MC-3+, MC-5	018
Midwest	Micro Elite TS 30 PS (Portable PC)	003*
Mitak	4022 (Portable PC)	003*
Olivetti	M19, M24, M28, M200	001
Olivetti	M240, M250, M290, M380, P500	003
Relisys	TR 175	003
RS-232 Host Port		050
RS-232 Aux Port		000
Serial Wedge		050
Televideo	990, 995, 9060	002
Texas Instruments	Extensa 560CD (Portable PC)	003*
Toshiba	2600 (Portable PC)	003*
Toshiba	Satellite T1960, T2130, CS (Portable PC)	003*
Wand Emulation Code 39 output (via Aux Port)		**
Wand Emulation Same Code output (via Aux Port)		**
WYSE	WY-30	013
WYSE	WY-85/185	016
WYSE ANSII	WY 60, 120, 150, 160, 325, 370, 99GT	015
WYSE ASCII	WY 60, 120, 150, 160, 325, 370, 99GT	014
WYSE Enhanced PC	WY 60, 120, 150, 160	018
Zenith	Z-note (Portable PC)	003*

*** Emulate External Keyboards** and **Automatic Direct Connect Mode** may also need to be turned on (see pages 2-9 and 2-11).

** Use Plug and Play Selections on page 2-4.

Keyboard and Delays Selections

Keyboard Country

This allows you to re-map the keyboard layout for your selected country. As a general rule, the following characters are not supported by the cordless system for countries other than the United States:

@ | $ # { } [ ] = / ‘ \ < > ~

*United States

Belgium

Denmark, Finland,
Norway, Sweden

France

Germany, Austria

United Kingdom

Switzerland

Italy

Keyboard Style Selections

Using the Keyboard Style selections, you can program special keyboard features, such as Caps Lock and Shift Lock.

Regular is used when you normally have the Caps Lock key off.

Caps Lock is used when you normally have the Caps Lock key on.

Shift Lock is used when you normally have the Shift Lock key on. (Not common to U.S. keyboards.)

Automatic Caps Lock is used if you change the Caps Lock key on and off. The software tracks and reflects if you have Caps Lock on or off (AT and PS/2 only). This selection can only be used with systems that have an LED that notes the Caps Lock status.

Emulate External Keyboard should be scanned if you do not have an external keyboard (IBM AT or equivalent).

*Regular

Caps Lock

Shift Lock

Automatic Caps Lock

Emulate External Keyboard

Keyboard Style Modifiers

This allows you to program special keyboard features, such as CTRL+ codes and Turbo Mode.

Control + ASCII Mode On: If you scan this selection, the cordless system sends key combinations for ASCII control characters for values 00-1F. Refer to page 6-1 for CTRL+ Values.

Control + ASCII Mode On

*Control + ASCII Mode Off

Turbo Mode: Selecting Turbo Mode On, (for the IBM AT only), programs the cordless system to send characters to the terminal faster.

Turbo Mode On

*Turbo Mode Off

Numeric Keypad Mode: Selecting Numeric Keypad Mode On sends numeric characters as if entered from a numeric keypad.

Numeric Keypad Mode On

*Numeric Keypad Mode Off

Automatic Direct Connect: When Emulate External Keyboard has been selected (page 2-9), Automatic Direct Connect Mode keeps the integrated keyboard from becoming permanently disabled. (This selection disables the keyboard for the duration of the bar code transmission.)

Automatic Direct Connect Mode On

*Automatic Direct Connect Mode Off

Output Delays Selection

This selection provides control of the time delays between data output by the cordless system to the host terminal. The actual delay is 5 milliseconds multiplied by the programmed value (00 - 99). Default = 00.

Intercharacter Delay is the time delay between data characters output by the cordless system to the host terminal.

Interfunction Delay is the time delay between function (key) codes output by the cordless system to the host terminal.

Intermessage Delay is the time delay between data messages or records output by the cordless system to the host terminal.

Example: You need a 45 millisecond delay. Scan the Intercharacter Delay bar code. Scan "0," "9," and Save on the Programming Chart (09 x 5ms = 45ms).

Intercharacter Delay (x5mS)[1]

Interfunction Delay (x5mS)[1]

Intermessage Delay (x5mS)[1]

1. A two-digit number and Save are required after scanning this programming bar code. Refer to the Programming Chart (inside back cover).

Wand Emulation Selections

Transmission Rate Selection

This programming selection sets the transmission rate from 10 ips (inches per second) to 300 ips if the cordless system is in Wand Emulation mode. Programming the transmission rate causes the data to be sent at the specified rate. The programmed transmission rate must be compatible with the device receiving the bar code data.

10

*25

40

80

120

150

200

300

Output Polarity Selection

This selection allows you to set the output logic convention for the digital output. The choices are White High and Black High.

White High

*Black High

Power Settings

Base Low Power Mode

You may want the base unit to draw less power when it is being powered by a portable data terminal or laptop. Use Base Low Power mode to tell the base to draw less power.

*Off

On

Note: Using Base Low Power Mode increases latency in radio communications.

Battery Conservation Mode

The scanner offers three low power modes: 1) No timeout, 2) Don't check base network before timeout, and 3) Check base network before timeout.

The lowest standby current is achieved with "No timeout" selected. When the scanner is idle, the standby current is about 15 mA. Radio contact is maintained and workgroup configuration settings are maintained. "No timeout" is the default setting and is recommended if the scanner is active for most of the workday and the charge pack is removed when the scanner is not in use. Alternately, to fully discharge the battery, leave the charge pack attached and power off the base. If the scanner goes out of range or the base unit is powered off, the scanner goes into an active search mode for the base. In this mode, the average current draw is about 50 mA.

*No Timeout

If "Don't check base network before timeout" is selected and the scanner is idle, the standby current is about 20 mA for one timeout period. The standby current then drops to about 10 mA until the trigger is pulled. The timeout period is selectable in increments of 15 minutes up to one hour. On the next trigger-pull, the scanner begins the reassociation process to restore the radio link and the workgroup configuration settings. This setting is recommended if the scanner is left inactive for long periods of time during the workday or if the charge pack is left attached when the scanner is not in use.

Don't Check for Network Base Before Timeout

The "Check base network before timeout" mode is identical to the previous mode except that when the timeout period expires, the scanner tests whether it is still in radio contact with the base. If radio contact has been lost, the standby current drops to about 10 mA; otherwise, it remains at 20 mA and the timeout clock begins another timeout period. This setting may be recommended if the charge pack is left attached and the base is powered off at the end of each working day.

Check for Network Base Before Timeout

Timeout Period Selections

Timeout after 15 minutes

Timeout after 30 minutes

Timeout after 45 minutes

*Timeout after 1 hour

Factory Default and Revision Report Selections

Reset Factory Settings

Scanning the **Factory Default Settings** bar code resets the cordless system to the original factory settings, clearing any programming changes you may have made. You may reset the factory default settings for the current application group or for all application groups.

The Current Application Group Default defaults only the settings described in Chapter 4 of this manual.

Factory Default Settings: Current Application Group

The ALL Application Groups Default sets the terminal ID to 003, then changes all settings to factory default values. (See Chapter 10 for a listing of all the factory defaults.)

Factory Default Settings: ALL Application Groups

Revision Report

Scan the Report Base Software Revision bar code to transmit the cordless base software revision level to the host terminal. The base software revision will be printed out as "Base software revision: X.XX, Radio: K.KK." (The "Xs" and "Ks" will vary according to the firmware revision.)

Report Base Software Revision

Scan the Report Scanner Software Revision bar code to transmit the cordless scanner software revision level to the host terminal.

Report Scanner Software Revision

3

Communications Menu

Introduction

Use this section to program the communications parameters for the cordless system.

This programming section contains the following menu selections:

- Host Port Protocol/Communications (RS-232)
- Auxiliary Port Protocol/Communications (RS-232)

Host Port Protocol

Default Host Port Protocol

<Default All Host Port RS-232 Protocol>

Baud Rate Selection

This selection sets the baud rate from 300 bits per second to 38,400 bits per second. Programming baud rate causes the data to be sent at the specified rate. The host terminal must be set up for the same baud rate as the cordless system to ensure reliable communication.

300

600

1200

2400

4800

9600

19200

*38400

Host Port Protocol

Parity Selection

This selection provides a means of checking character bit patterns for validity. The cordless system can be configured to operate under Even, Odd, Mark, None, or Space parity options. The host terminal must be set up for the same parity as the cordless system to ensure reliable communication.

*None

Space

Mark

Even

Odd

Word Length Data Bits Selection

This selection sets the Word Length at seven or eight bits of data per character. If an application requires only ASCII Hex characters 0 through 7F decimal (text, digits, and punctuation), select 7 data bits. For applications requiring use of the full ASCII set, select 8 data bits per character.

7 Data Bits

*8 Data Bits

Host Port Protocol

Word Length Stop Bits Selection

This selection sets the Word length at one or two stop bits.

*1 Stop Bit

2 Stop Bits

Hardware Flow Control Selection

This selection turns on hardware flow control that checks for a CTS signal before sending data. This option is useful when your application supports the CTS signal.

Note: This selection cannot be used with Serial Wedge Output Selection.

On

*Off

Host Port Communications

Serial Wedge Output Selection

This selection selects the serial output direction required by your application. P1 and P2 are serial wedge designations printed on the serial wedge cable. Usually, one goes to the host and one goes to the terminal, depending on your specific application and the serial wedge cable.

To P1

To P1 and P2

To P2

*None (Host Port RS-232)

Host ACK Selection

Some applications require that the host terminal (or server) approve or reject incoming bar code data and notify the operator of these actions. These applications require that the host maintain control over the response indicators emitted from the source scanner. Turning the Host ACK selection on, configures the cordless system scanners to respond to commands from the host system.

The following criteria must be met for the Host ACK to work correctly:

- The cordless system must be configured for “Host Port RS-232” (Terminal ID = 050)
- Both the host terminal and the cordless system must have RTS/CTS handshaking ("Hardware Flow Control Selection" on page 3-4) enabled.
- Host ACK must be enabled (page 3-7).
- System performance degrades when using Host ACK at rates lower than 9600.
- The host terminal software must be capable of interpreting the bar code data, make decisions based on the data content, and send out appropriate escape commands to the source scanner.

Escape commands are addressed to the source scanner via “Application Work Groups.” Once a command is sent, all scanners in a group respond to that command. Because of this situation, **it is recommended that each scanner is assigned to its own group**.

The commands to which the scanner responds are listed on page 3-8 and page 3-9. The <ESC> is a **1B hex**. A typical command string is **y <ESC> x,** where “y” is the application work group number, “<ESC> x” is the escape command, and the comma is the terminator.

Up to twenty commands may be strung together to create custom response sequences. An example of a command is listed below.

0<ESC>4<ESC>5<ESC>6,

The above example will make a scanner in application work group zero beep low**,** medium, high.

Once Host ACK is enabled, the system works as follows:

- The scanner reads a code and sends data to the base/host system. No audible or visual indication is emitted, unless “Decode Beep” is enabled (page 3-10). The scanner read indicator goes out upon a successful read.
- Scanner is suspended until 1) a valid escape string is received from the host system (via the base) or 2) the scanner “times out.”
- Once condition 1 or 2 above has been met, the scanner is ready to scan again, and the process repeats.

Host Port Communications

Time out is indicated by three rapid beeps at the same pitch. A time out occurs if the source scanner does not receive a valid escape command in 10 seconds. If a time out occurs, the operator should check the host system to understand why a response to the scanner was not received.

Host ACK Enable

On

*Off

Host Port Communications

Escape Commands

The tables below list the escape commands that must be generated from the host system and the resulting action(s).

ST5770 Escape Commands

Command	Action
<ESC> a	Beep (two high tones), illuminate green LED for two seconds
<ESC> b	Beep (three low tones), illuminate green LED nine times
<ESC> 1	Illuminate green LED for 135 milliseconds
<ESC> 2	Illuminate green LED for two seconds
<ESC> 3	Illuminate green LED for five seconds
<ESC> 4	One beep at low volume
<ESC> 5	One beep at medium volume
<ESC> 6	One beep at high volume
<ESC> 7	Beep (one medium tone), illuminate green LED two seconds
<ESC> 8	Beep (three low tones), illuminate green LED nine times

IT3870 Escape Commands

Command	Action
<ESC> a	Indicate as if successful menu change made
<ESC> b	Indicate as if unsuccessful menu change made
<ESC> 1	Illuminate green LED for 135 milliseconds (followed by at least 70 mSecs. dark time when multiple blinks)
<ESC> 2	Illuminate green LED for two seconds (followed by at least 500 mSecs. dark time when multiple blinks)
<ESC> 3	Illuminate green LED for five seconds (followed by at least 500 mSecs. dark time when multiple blinks)
<ESC> 4	One beep at low volume
<ESC> 5	One beep at medium volume
<ESC> 6	One beep at high volume
<ESC> 7	Indicate as successful decode and communication to host.
<ESC> 8	Indicate as unsuccessful decode and communication to host.

Decode Beep Selection

Note: Decode Beep mode is active only when the programming selections Host ACK (page 3-6) or Data Format Required (page 4-19) are turned on.

When Host ACK Selection is on, the scanner will only beep/blink in response to the Escape commands generated by the host. Should you also want the scanner to beep when a bar code has been successfully decoded and successfully communicated to the base, turn the Decode Beep Selection on.

When Data Format Required is on, the scanner will only beep if the input data conforms to the edited format or triple beep if it does not meet the format requirements. Should you also want the scanner to beep when a bar code has been successfully read and sent to the host from the base, turn on the Decode Beep Selection.

On

*Off

Auxiliary Port Input Protocol

Default Auxiliary Port Protocol

<Default All Auxiliary Port Protocol>

Baud Rate Selection

This selection sets the baud rate from 300 bits per second to 38,400 bits per second. Programming baud rate causes the data to be sent at the specified rate. The device connected to the Auxiliary Port must be set up for the same baud rate as the Aux Port to ensure reliable communication.

300

600

1200

2400

4800

9600

19200

*38400

Auxiliary Port Input Protocol

Parity Selection

This selection provides a means of checking character bit patterns for validity. The Auxiliary Port can be configured to operate under Even, Odd, Mark, None, or Space parity options. The device connected to the Auxiliary Port must be set up for the same parity as the Aux Port to ensure reliable communication.

*None

Space

Mark

Even

Odd

Word Length Data Bits Selection

This selection sets the Word Length at seven or eight bits of data per character. If an application requires only ASCII Hex characters 0 through 7F decimal (text, digits, and punctuation), select 7 data bits. For applications requiring use of the full ASCII set, select 8 data bits per character.

7 Data Bits

*8 Data Bits

Auxiliary Port Input Protocol

Word Length Stop Bits Selection

This selection sets the Word Length at one or two stop bits.

*1 Stop Bits

2 Stop Bits

Hardware Flow Control Selection

This selection turns on hardware flow control that checks for a CTS signal before sending data. This option is useful when your application supports the CTS signal.

On

*Off

Note: The Auxiliary Port receive function will only work properly if RTS/CTS or ACK/NAK flow control is used. If your host system does not support RTS/CTS or ACK/NAK handshaking, some or all of your data will be lost.

Auxiliary Port Input Communications

IBM 4683 Async Address Selections

If you are going to program the interface for IBM 4683 Async Addresses, you must first program the Terminal ID as 51 (see page 2-6). Then, scan one of the programming codes below for your 4683 Async Address selection.

Note: When using any of the IBM 4683 interfaces, the maximum allowable data rate into the base aux port is 9600 baud.

Address $68
(Socket 23: 2A Left)

Address $69
(Socket 23: 2B Right)

Address $64
(Socket 25: 2A Left)

Address $65
(Socket 25: 2B Right)

Aux Port Disable

Auxiliary Port Input Communications

Protocol Selection

This selection programs the Auxiliary Port for the protocol required by the input device to the Auxiliary Port. The protocol is a set of rules concerning the exchange of data between serially communicating devices. The Auxiliary Port supports Record, Burst, and ACK/NAK protocols when receiving data from an RS-232 device.

When the Aux Port is being used as an input, data packets can be sent from the peripheral to the Aux Port in two different forms (See "Data Character Selection" on page 3-16).

- Record -- a single string of data that is to be sent to the host system.
- Block -- several strings of data that are to be appended together within the base and sent to the host system as a single message.

The programmer should determine which of the four selections below best meets the requirements of the peripheral.

- Record -- used when the transmitting peripheral is sending messages when no confirmation of receipt is required.
- Record ACK/NAK -- same as Record, however the base responds to the peripheral upon receipt of the message. The <ACK> (acknowledge) character (ASCII 06 hex) is sent to the peripheral to acknowledge that a <NAK> (non-acknowledge) character (ASCII 15 hex) is sent when the message is not received correctly.
- Block ACK/NAK -- same as Record ACK/NAK, but the <ACK> or <NAK> is issued upon completion of the block message.
- Burst -- used when XON/XOFF software flow control is required by the transmitting peripheral.

*Record

Burst

Record ACK/NAK

Block ACK/NAK

Auxiliary Port Input Communications

Data Character Selection

This selection selects the serial output data characters that may be sent from the RS-232 device connected to the Auxiliary Port.

When the Aux Port is used as an input, it is recommended (although not required) that incoming messages be "framed" by start and stop characters. These framing characters indicate to the base the beginning and end of a message. The use of these characters decreases the possibility of missing or partial messages being sent to the host system.

Note: These characters are stripped from the message within the base and are not sent to the host system.

The bar codes below are used to configure the base to conform to the specific framing characters sent from the peripheral device.

- SOR -- used to program the starting frame character of a "record"
- EOR -- used to program the ending frame character of a "record"
- SOB -- used to program the starting frame character of a "block"
- EOB -- used to program the ending frame character of a "block"

Default SOR Character = none (NUL: 00).
Default EOR Character = Carriage Return (CR: 0D).
Default SOB Character = none (NUL: 00).
Default EOB Character = End of Text (EOT: 04).

SOR (Start of Record)[1]

EOR (End of Record)[1]

SOB (Start of Block)[1]

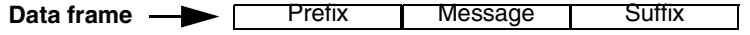
EOB (End of Block)[1]

1. A two-digit number and Save are required after scanning this programming bar code. Refer to the Programming Chart (inside back cover).

Auxiliary Port Input Communications
Aux Prefix/Suffix Selections

Aux Prefix and Suffix

Aux Prefix and Suffix characters are data characters you may assign to incoming Auxiliary Port data.



Characters for the Prefix and Suffix are selected by their hexadecimal ASCII value, up to 12 characters each. Prefix and Suffix characters may be assigned to all incoming data.

Default Prefix (incoming data) = none.
Default Suffix (incoming data) = none.
Default Prefix (outgoing data) = none.
Default Suffix (outgoing data) = Carriage Return (CR).

Programming Steps to Add an Aux Prefix / Suffix to Incoming Data:

Step 1. To add a Prefix, scan the **Add Aux Prefix** programming bar code. To add a Suffix, scan the **Add Aux Suffix** programming bar code.

Step 2. Scan two bar codes for the Hex Value "72" ("r," which represents the identifier for the Aux Port). Scan the two digits on the Programming Chart (on the inside back cover of this manual).

Step 3. Refer to the Hex ASCII Chart(page 3-19) to find the Hex value that represents the ASCII characters you wish to attach to the data. Use the Programming Chart (inside back cover) to scan the alphanumeric combination that represents the ASCII characters.

Step 4. To complete Aux Prefix / Suffix programming, scan either:
Save - This exits, saving the Prefix / Suffix selections you just assigned.
Discard - This exits without changing the Prefix / Suffix.

Other Programming Selections: Scanning the Default Prefix or Default Suffix bar code sets the default Prefix or Suffix (shown above).

Scanning the **Clear All Prefixes** or **Clear All Suffixes** bar code deletes all Prefix or Suffix selections.

If you want to turn off the prefix or suffix formatting for a period of time, scan **Disable Aux Prefix/Suffix**. To turn back on, scan **Enable Aux Prefix/Suffix**.

Note: Aux Prefix / Suffix programming examples may be found on page 3-18.

Aux Prefix and Suffix Examples

Example 1: Add a Prefix

To add an HT (tab) Prefix to incoming data:

Step 1. Scan the **Add Aux Prefix** Prefix Selection bar code.

Step 2. Scan **7** and **2** on the Programming Chart (inside back cover).

Step 3. An "HT" is equivalent to "09" (see the Hex ASCII Chart). Scan **0** and **9** on the Programming Chart.

Step 4. Scan Save.

Example 2: Add a Suffix

To add a CR (carriage return) Suffix to incoming data:

Step 1. Scan the **Add Aux Suffix** Suffix Selection bar code.

Step 2. Scan **7** and **2** on the Programming Chart (inside back cover).

Step 3. A "CR" is equivalent to "0D" (see the Hex ASCII Chart). Scan **0** and **D** on the Programming Chart.

Step 4. Scan **Save**.

*Note: If the Aux Port ID is required in conjunction too other prefixes, scan **5 C 8 0**.*

*Note: To program a backslash (\), scan **5 C 5 C**.*

Decimal to Hex to ASCII Conversion Chart

Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII
0	00	NUL	32	20	SP	64	40	@	96	60	‘
1	01	SOH	33	21	!	65	41	A	97	61	a
2	02	STX	34	22	“	66	42	b	98	62	b
3	03	ETX	35	23	#	67	43	C	99	63	c
4	04	EOT	36	24	$	68	44	D	100	64	d
5	05	ENQ	37	25	%	69	45	E	101	65	e
6	06	ACK	38	26	&	70	46	F	102	66	f
7	07	BEL	39	27	‘	71	47	G	103	67	g
8	08	BS	40	28	(	72	48	H	104	68	h
9	09	HT	41	29	)	73	49	I	105	69	i
10	0A	LF	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	60	3C	<	92	5C	\	124	7C	|
29	1D	GS	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	62	3E	>	94	5E	^	126	7E	~
31	1F	US	63	3F	?	95	5F	_	127	7F	DEL

Auxiliary Port Input Communications

Aux Prefix Selection

Add Aux Prefix[1]

Default Aux Prefix *(none)*

Clear All Aux Prefixes

Aux Suffix Selection

Add Aux Suffix[1]

Default Aux Suffix *(CR)*

Clear All Aux Suffixes

1. One or more two-digit numbers and Save are required after scanning this programming bar code. Refer to the Programming Chart (inside back cover).

Exit Selection for Aux Prefix / Suffix

Save

Discard

Auxiliary Port Input Communications

Aux Prefix On/Off

The following selections allow you to turn on and off the Aux Prefix and Suffix formatting. These codes are used when you want to toggle between turning on and off the prefix and/or suffix formatting.

*On

Off

Aux Suffix On/Off

*On

Off

Aux Port I.D. Transmit Selection

This will attach the Aux Port identifier (which is the letter “r”) to the incoming data at the Auxiliary Port and will send it along with the data to the host device.

On

*Off

Auxiliary Port Input Communications

Aux Data Format Editor Selections

The Aux Data Format Editor selections are used to edit incoming data to the aux port. For example, you can use the Aux Data Format Editor to insert characters at certain points in bar code data as it is scanned.

It is not necessary to use the Aux Data Format Editor. A set of defaults for the aux data format is already programmed in the base. The selections in the following pages are used only if you wish to alter the default settings. *Default Aux Data Format setting = none.*

If you have changed aux data format settings, and wish to clear all formats and return to the defaults, scan the **Default Aux Data Format** code.

To Add an Aux Data Format

Step 1. Scan the **Enter Aux Data Format** symbol (page 3-26).

Step 2. Primary/Alternate Format
Determine if this will be your primary aux data format, or one of 3 alternate formats. (Alternate formats allow you "single shot" capability to scan one bar code using a different aux data format. After the one bar code has been read, the scanner reverts to the primary aux data format. See page 3-27.) If you are programming the primary format, scan **0**. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are programming.

Step 3. Terminal Type
Refer to the Supported Terminals Chart (page 2-6) and locate the Terminal ID number for your PC. Scan 3 numeric bar codes on the inside back cover to program the scanner for your terminal ID (you must enter **3** digits). For example, scan **0 0 3** for an IBM AT.

*Note: To apply a format to all terminal types, a universal code of **099** is used.*

Step 4. Code I.D.
Scan 7 then 2 from the Programming Chart. (This is the hex value for "r," the aux port I.D.)

Step 5. Length
Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the 4 digit data length from the Programming Chart. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.)

Step 6. Editor Commands

Refer to the Format Editor Commands (page 3-24). Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.

Step 7. Scan **Save** to save your entries.

Other Programming Selections

- **Clear One Aux Data Format**
  This deletes one aux data format for one symbology. If you are clearing the primary aux format, scan 0. If you are clearing an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are clearing. Scan the Terminal Type (refer to the Supported Terminals Chart on page 2-6), then **7**, **2** (for the aux port I.D.), and the length of the format you want to delete. That length aux data format for that symbology is deleted and all other formats are unaffected.
- **Save**
  This exits, saving any Aux Data Format changes.
- **Discard**
  This exits without saving any Aux Data Format changes.

Aux Data Formatter Example

Five digit data is sent to the Auxiliary Port, however the host system can only accept eight digit data. Three zeroes must be added to the beginning of the Aux Port data.

Received	Must send
12345	00012345

Refer to the Aux Format Editor Commands on page 3-24 to format the following example. The programming bar codes on page 3-26 and the alphanumeric bar codes on the inside back cover are used to program the aux data formatter.

- Scan the **Enter Aux Data Format** bar code (page 3-26).
- Scan **0** (primary) or **1** or **2** or **3** (for alternates).
- Scan **0 9 9** (all terminal types).
- Scan **7 2** (the hex value for the aux port).
- Scan **0 0 0 5** (the data length).

Auxiliary Port Input Communications

The Aux Data Editor Commands are:

- Scan **F 4** (see page 3-24 for a description).
- Scan **3 0** (hex value for 0).
- Scan **0 3** (indicating the 0 should be sent 3 times).
- Scan **F 1** to send the data, then **0 0** (the hex value for NUL).
- Scan **Save** to end the Aux Data Formatting.

Aux Format Editor Commands

Send Commands

F1 Send all characters followed by “xx” key or function code, starting from current cursor position. **Syntax = F1xx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

F2 Send “nn” characters followed by “xx” key or function code, starting from current cursor position. **Syntax = F2nnxx** (nn stands for the numeric value (00-99) for the number of characters and xx stands for the hex value for an ASCII code. See Hex to ASCII Conversion chart, page 3-19.)

F3 Send up to but not including “ss” character (Search and Send) starting from current cursor position, leaving cursor pointing to “ss” character followed by “xx” key or function code. **Syntax = F3ssxx** (ss and xx both stand for the hex values for ASCII codes, see Hex to ASCII Conversion chart, page 3-19.)

F4 Send “xx” character “nn” times (Insert) leaving cursor in current cursor position. **Syntax = F4xxnn** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19, and nn is the numeric value (00-99) for the number of times it should be sent.)

E9 Send all but the last “nn” characters, starting from the current cursor position. **Syntax = E9nn** (nn is the numeric value (00-99) for the number of characters that will not be sent at the end of the message.)

Move Commands

F5 Move the cursor ahead “nn” characters from current cursor position. **Syntax = F5nn** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved ahead.)

F6 Move the cursor back “nn” characters from current cursor position. **Syntax = F6nn** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved back.)

F7 Move the cursor to the beginning of the data string. **Syntax = F7**.

EA Move the cursor to the end of the data string. **Syntax = EA**.

Search Commands

F8 Search ahead for “xx” character from current cursor position, leaving cursor pointing to “xx” character. **Syntax = F8xx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

F9 Search back for “xx” character from current cursor position, leaving cursor pointing to “xx” character. **Syntax = F9xx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

E6 Search ahead for the last instance of “xx” character from the current cursor position, then increment cursor. **Syntax = E6xx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

E7 Search back for the last instance of “xx” character from the current cursor position, then increment cursor. **Syntax = E7xx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

Miscellaneous Commands

FB Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. **Syntax = FBnnxxyy . .zz** where nn is a count of the number suppress characters in the list and xxyy .. zz is the list of characters to be suppressed. (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

FC Disable suppress filter and clear all suppressed characters. **Syntax = FC**.

E4 Replaces up to 15 characters in the data string with user specified characters. Replacement continues until the E5 command is encountered. **Syntax = E4nn$xx_1xx_2yy_1yy_2...zz_1zz_2$** where nn is the total count of both characters to be replaced plus replacement characters; xx_1 defines characters to be replaced and xx_2 defines replacement characters, continuing through zz_1 and zz_2.

E5 Terminates character replacement. **Syntax = E5**.

FE Compare character in current cursor position to the character “xx.” If characters are equal, increment cursor. If characters are not equal, no format match. **Syntax = FExx** (xx stands for the hex value for an ASCII code, see Hex to ASCII Conversion chart, page 3-19.)

EC Check to make sure there is a numeric character at the current cursor position. If character is not numeric, format is aborted. **Syntax = EC**.

ED Check to make sure there is a non-numeric character at the current cursor position. If character is numeric, format is aborted. **Syntax = ED**.

EF Inserts a delay of up to 49,995 milliseconds (in multiples of 5). **Syntax = EFnn** where nn is a count of the number 5 ms delays, up to 9,999.

Auxiliary Port Input Communications

Aux Data Format Editor

See through page 3-22 through page 3-25 for a description of Aux Data Format selections and commands.

Enter Aux Format

Default Aux Data Format

Clear One Aux Data Format

Clear All Aux Data Formats

Save Current Changes

Discard Current Changes

Aux Data Formatter

When Aux Data Formatter is turned off, the data coming in to the aux port is output to the host as received (including prefixes and suffixes).

*Aux Data Formatter On

Aux Data Formatter Off

Auxiliary Port Input Communications

Require Aux Data Format

When Aux Data Formatter is required, all incoming data must conform to an edited format or the base does not transmit the input data to the host device. If this occurs, the data is discarded. *Default = Not Required.*

Aux Data Format Required

*Aux Data Format Not Required

Alternate Aux Data Formats

Alternate formats allow you “single shot” capability to edit incoming data using a different aux data format than your primary aux format. When aux data formats are programmed (see page 3-17), you must input whether you are programming the primary aux format, or an alternate format numbered 1, 2, or 3.

An alternate aux format is initiated by scanning one of the 3 alternate aux format bar codes below. The base will edit the incoming data, formatting the data with the selected alternate aux format, then revert immediately to the primary aux format.

Alternate Aux Data Format 1

Alternate Aux Data Format 2

Alternate Aux Data Format 3

Application Work Group Menu

Introduction

Use this section to program parameters for application work groups for the cordless system.

This programming section contains the following menu selections:

- Output Selections (User Feedback)
- Prefix and Suffix
- Data Formatter

Each cordless scanner can be assigned to one of nine application work groups. Each work group may be set up in a different configuration using the programming selections found in this section of the manual. For example, one group may need the beeper turned off, will only scan Code 39 bar codes, and needs a carriage return suffix added to the data being sent to the host system via the base. Another group may require that scanner voting be turned on, will scan UPC A, and needs a space added to the transmitted data, between the main UPC bar code data and the five digit addenda.

The Application Work Groups Selection (on the next page) sets up the scanner according to one of the application work group(s). After you've scanned the association bar code on the base, scan one of the work group numbers to assign the cordless scanner to a specific group. The scanner then receives all of the corresponding parameters from the base unit. You may then alter the parameters your application requires from the Output (User Feedback), Prefix and Suffix, Data Formatter Selections, and symbology menu pages.

To add a new cordless scanner to an established group, associate the scanner to the base and scan the application work group number. The scanner will automatically reconfigure to operate and send data to the host system according to that group's programmed selections. Any programming selections you change or make with one cordless scanner will affect all the scanners in the same work group.

Note: To program a group's parameters, you must first scan the group number and then the programming selections (prefix, suffix, data formatter, etc.). The parameters can't be programmed first and then "made" a group by scanning an application work group number.

To remove a scanner associated with a base unit, use the Remove Scanner Selection on page 4-3. For instance, if nine scanners are associated with a base (the maximum number) and you want to add a new scanner, you will need to remove one scanner from the network. After removing one scanner by using the Remove Scanner programming bar code, add the new scanner by scanning the association bar code on the base unit.

Output Selections

Application Work Group Selection

This programming selection sets up application work groups sharing specific programming settings (such as Beeper Volume, Scanner Voting, Prefix / Suffix, and Data Formatter). Scan the group number and then program the selections your application requires. (Refer to the introduction, page 4-1, for more information on application work groups.)

* Group 0

Group 1

Group 2

Group 3

Group 4

Group 5

Group 6

Group 7

Group 8

Remove Scanner Selection

This programming selection removes a scanner from an associated base unit.

Remove Scanner

Beeper Volume Selection

Off

Low

Medium

*High

Beeper Pitch

You may wish to set your beeper to a higher or lower pitch. This feature is helpful if there are several scanners being used in close proximity. Different pitches make it easier to distinguish which scanner is beeping.

Low

*Medium

Medium High

High

Scanner Voting Selection

The scanner offers three levels of voting for decoded messages: off, normal, and high. The greatest decoding speed is achieved by turning voting off. The greatest level of security is achieved by selecting the high voting level. The high voting level is the recommended setting when reading poor quality bar codes. The normal voting level provides a balance of good decoding speed and security.

Regardless of voting level selection, the decoded message format and length may be qualified before the message is transmitted. This will provide additional security. If format and length requirements are not met, the message will not be transmitted. Refer to Data Formatter Selections (page 4-15) to set format requirements. Refer to Chapter 5 to set message length requirements, by symbology.

Note: To maximize both decoding speed and security, it is recommended to disable all symbologies that will not be used.

When voting is turned off, a bar code needs only to be read one time for a decode.

Off

When the normal voting level is selected, a bar code needs to be read multiple times for a decode. The number of votes depends on the symbology and the message length. Since greater security is appropriate for shorter messages, short messages require more votes than long messages.

*Voting Normal

The high voting level works much like the normal level, except that short messages require twice as many votes. Note that for the ST5770, the high level works identical to the normal level.

Voting High

Laser Marker Beam (ST5770 only)

When this selection is turned on (short or long duration), the cordless scanner shows a marker or locator beam before the red scan line opens across a bar code and the scanning process begins. The marker beam, emitted by centering the optical scan mirror, appears as a bright spot of illumination that serves as an aiming guide when bar code targets are at a distance from the scanner.

Note: If this selection is turned on, scanning is delayed for 0.5 or 1.2 seconds while the marker beam is enabled.

*Off

Short Duration (.5 seconds)

Long Duration (1.2 seconds)

AIM I.D. Prefix

This selection allows you to turn on or off the transmission of an Aim I.D. before the decoded symbology. (See the Symbology Chart below for the single AIM character code that identifies each symbology.) When you scan the **On** code, all current prefixes are cleared, then an AIM I.D. for all symbologies is programmed.

On

*Off

Code I.D. Prefix

This selection allows you to turn on or off the transmission of a Code I.D. before the decoded symbology. (See the Symbology Chart below for the single character code that identifies each symbology.) When you scan the **On** code, all current prefixes are cleared, then a Code I.D. for all symbologies is programmed.

On

*Off

Symbology Chart

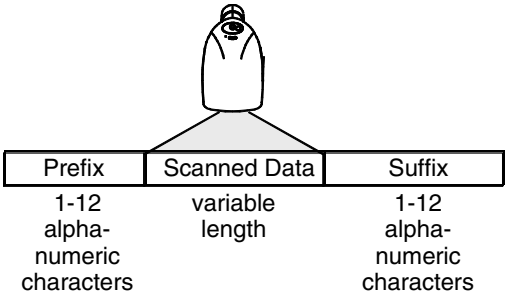
Symbology	AIM ID	Code ID	Symbology	AIM ID	Code ID
Codabar	]F*m*	a	Code 128	]C*m*	j
Code 39	]A*m*	b	Matrix 2 of 5	]X*m*	m
UPC	]E*m*	c	Telepen	]B*m*	t
EAN	]E*m*	d	PDF417	]L*m*	r
Interleaved 2 of 5	]I*m*	e	MicroPDF417	]L*m*	R
Code 2 of 5, IATA (with 2-bar start/ stop patterns)	]R*m*	f	Reduced Space Symbology (RSS)	]e*m*	y
Code 2 of 5, Industrial (with 3-bar start/stop patterns)	]S*m*	f	EAN•UCC Composite	]e*m*	y
Code 11	]H*m*	h	China Post Code	]X*m*	q
Code 93	]G*m*	i			

Note: where m represents the AIM modifier character, see AIM International Technical Specification - Symbology Identifiers

Prefix/Suffix Selections

When a bar code is scanned, additional information is sent to the host computer along with the bar code data. This group of bar code data and additional, user-defined data is called a "message string." The selections in this section are used to build the user-defined data into the message string.

Prefix and Suffix characters are data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. The following illustration shows the breakdown of a message string:



Points to Keep In Mind

- It is not necessary to customize the message string. The selections in this chapter are only used if you wish to alter the default settings. *Default prefix = None. Default suffix = CR*.
- If desired, each decoded symbology may be assigned a unique prefix and suffix.
- You can add any prefix or suffix from the ASCII chart (page 4-14), plus Code I.D. and Aim I.D.
- You can string together several entries for several symbologies at one time.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.

To Add a Prefix or Suffix:

Step 1. Scan the **Add Prefix** (page 4-11) or **Add Suffix** symbol (page 4-11).

Step 2. Determine the 2 digit Hex value from the Symbology Chart (page 4-12) for the symbology to which you want to apply the prefix or suffix.

Step 3. Scan the 2 hex digits from the Programming Chart inside the back cover or scan **9**, **9** for all symbologies.

Step 4. Determine the hex value from the Decimal to Hex to ASCII Conversion Chart (page 4-14) for the prefix or suffix you wish to enter.

Step 5. Scan the 2 digit hex value from the Programming Chart inside the back cover.

Step 6. Repeat Steps 4 and 5 for every prefix or suffix character.

Step 7. To add the Code I.D., scan **5**, **C**, **8**, **0**.
To add AIM I.D., scan **5**, **C**, **8**, **1**.
To add a backslash (\), scan **5**, **C**, **5**, **C**.

Step 8. Scan **Save** to exit and save, or scan **Discard** to exit without saving.

Repeat Steps 1-6 to add a prefix or suffix for another symbology.

Example: Add a Suffix to a specific symbology

To send a CR (carriage return) Suffix for UPC only:

Step 1. Scan **Add Suffix**.

Step 2. Determine the 2 digit hex value from the Symbology Chart (page 4-12) for UPC.

Step 3. Scan **6**, **3** from the Programming Chart (inside back cover).

Step 4. Determine the hex value from the Decimal to Hex to ASCII Conversion Chart (page 4-14) for the CR (carriage return).

Step 5. Scan **0**, **D** from the Programming Chart (inside back cover).

Step 6. Scan **Save**, or scan **Discard** to exit without saving.

To Clear One or All Prefixes or Suffixes:

You can clear a single prefix or suffix, or clear all prefixes/suffixes for a symbology. When you Clear One Prefix (Suffix), the specific character you select is deleted from the symbology you want. When you Clear All Prefixes (Suffixes), all the prefixes or suffixes for a symbology are deleted.

Step 1. Scan the **Clear One Prefix** or **Clear One Suffix** symbol.

Step 2. Determine the 2 digit Hex value from the Symbology Chart (page 4-12) for the symbology from which you want to clear the prefix or suffix.

Step 3. Scan the 2 digit hex value from the Programming Chart inside the back cover or scan **9**, **9** for all symbologies.

Your change is automatically saved.

Prefix Selections

Add Prefix[1]

Default Prefix *(none)*

Clear One Prefix[1]

Clear All Prefixes

Suffix Selections

Add Suffix[1]

Default Suffix *(CR)*

Clear One Suffix[1]

Clear All Suffixes

1. One or more two-digit numbers and Save are required after scanning this programming bar code. Refer to the Programming Chart (inside back cover).

Exit Selection for Prefix/Suffix

Save

Discard

Symbology Chart

Symbology	Code ID	Hex ID	Symbology	Code ID	Hex ID
Codabar	a	61	Code 128	j	6A
Code 39	b	62	Matrix 2 of 5	m	6D
UPC	c	63	Telepen	t	74
EAN	d	64	PDF417	r	72
Interleaved 2 of 5	e	65	MicroPDF417	R	52
Code 2 of 5, IATA (with 2-bar start/stop patterns)	f	66	Reduced Space Symbology (RSS)	y	79
Code 2 of 5, Industrial (with 3-bar start/stop patterns)	f	66	EAN•UCC Composite	y	79
Code 11	h	68	China Post Code	q	71
Code 93	i	69	*All Symbologies*[1]		99

1.Prefix/Suffix Programming **only**!

Note: Prefix/Suffix entries for specific symbologies override the universal (All Symbologies, 99) entry.

Work Group Prefix On/Off

The following selections allow you to turn on and off the prefix and suffix formatting. These codes are used when you want to toggle between turning on and off the prefix and suffix formatting.

*On

Off

Suffix On/Off

*On

Off

Decimal to Hex to ASCII Conversion Chart

Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII
0	00	NUL	32	20	SP	64	40	@	96	60	‘
1	01	SOH	33	21	!	65	41	A	97	61	a
2	02	STX	34	22	“	66	42	b	98	62	b
3	03	ETX	35	23	#	67	43	C	99	63	c
4	04	EOT	36	24	$	68	44	D	100	64	d
5	05	ENQ	37	25	%	69	45	E	101	65	e
6	06	ACK	38	26	&	70	46	F	102	66	f
7	07	BEL	39	27	‘	71	47	G	103	67	g
8	08	BS	40	28	(	72	48	H	104	68	h
9	09	HT	41	29	)	73	49	I	105	69	i
10	0A	LF	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	60	3C	<	92	5C	\	124	7C	l
29	1D	GS	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	62	3E	>	94	5E	^	126	7E	~
31	1F	US	63	3F	?	95	5F	_	127	7F	DEL

Data Formatter Selections

The Data Format Editor selections are used to edit scanned data. For example, you can use the Data Format Editor to insert characters at certain points in bar code data as it is scanned.It is not necessary to use the Data Format Editor. A set of defaults for the data format is already programmed in the scanner. The selections in the following pages are used only if you wish to alter the default settings. Default Data Format setting = none.

If you have changed data format settings, and wish to clear all formats and return to the defaults, scan the **Default Data Format** code on page 4-18.

To Add a Data Format

Step 1. Scan the **Enter Data Format** symbol (page 4-18).

Step 2. Primary/Alternate Format
Determine if this will be your primary data format, or one of 3 alternate formats. (Alternate formats allow you "single shot" capability to scan one bar code using a different data format. After the one bar code has been read, the scanner reverts to the primary data format. See page 4-20.) If you are programming the primary format, scan **0**. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are programming.

Step 3. Terminal Type
Refer to the Supported Terminals Chart (page 2-6) and locate the Terminal ID number for your PC. Scan 3 numeric bar codes on the inside back cover to program the scanner for your terminal ID (you must enter 3 digits). For example, scan **0 0 3** for an AT wedge.

Note: The wildcard for all terminal types is 099.

Step 4. Code I.D.
On page 4-12, find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart.

Step 5. Length
Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the four digit data length from the Programming Chart. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.)

Step 6. Editor Commands
Refer to the Format Editor Commands Chart (page 4-16). Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.

Step 7. Scan **Save** to save your entries.

Other Programming Selections

- **Clear One Data Format**
  This deletes one data format for one symbology. If you are clearing the primary format, scan **0**. If you are clearing an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are clearing. Scan the Terminal Type (refer to the Supported Terminals Chart on page 2-6), Code I.D. and the length of the format you want to delete. That length data format for that symbology is deleted and all other formats are unaffected.
- **Save**
  This exits, saving any Data Format changes.
- **Discard**
  This exits without saving any Data Format changes.

Data Format Editor Commands

Send Commands

F1 Send all characters followed by "xx" key or function code, starting from current cursor position. ***Syntax = F1xx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

F2 Send "nn" characters followed by "xx" key or function code, starting from current cursor position. ***Syntax = F2nnxx*** (nn stands for the numeric value (00-99) for the number of characters and xx stands for the hex value for an ASCII code. See Decimal to Hex to ASCII Conversion chart, page 4-14.)

F3 Send up to but not including "ss" character (Search and Send) starting from current cursor position, leaving cursor pointing to "ss" character followed by "xx" key or function code. ***Syntax = F3ssxx*** (ss and xx both stand for the hex values for ASCII codes, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

F4 Send "xx" character "nn" times (Insert) leaving cursor in current cursor position. ***Syntax = F4xxnn*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14, and nn is the numeric value (00-99) for the number of times it should be sent.)

E9 Send all but the last "nn" characters, starting from the current cursor position. ***Syntax = E9nn*** (nn is the numeric value (00-99) for the number of characters that will not be sent at the end of the message.)

Move Commands

F5 Move the cursor ahead "nn" characters from current cursor position. ***Syntax = F5nn*** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved ahead.)

F6 Move the cursor back "nn" characters from current cursor position. ***Syntax = F6nn*** (nn stands for the numeric value (00-99) for the number of characters the cursor should be moved back.)

F7 Move the cursor to the beginning of the data string. ***Syntax = F7.***

EA Move the cursor to the end of the data string. ***Syntax = EA***

Search Commands

F8 Search ahead for "xx" character from current cursor position, leaving cursor pointing to "xx" character. ***Syntax = F8xx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

F9 Search back for "xx" character from current cursor position, leaving cursor pointing to "xx" character. ***Syntax = F9xx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

E6 Search ahead for the first non "xx" character from the current cursor position, leaving cursor pointing to non "xx" character. ***Syntax = E6xx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

E7 Search back for the first non "xx" character from the current cursor position, leaving cursor pointing to non "xx" character. ***Syntax = E7xx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

Miscellaneous Commands

FB Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. **Syntax = FBnnxxyy . .zz** where nn is a count of the number suppress characters in the list and xxyy .. zz is the list of characters to be suppressed. (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

FC Disable suppress filter and clear all suppressed characters. ***Syntax = FC***.

EB Toggles the auxiliary port on and off. This command is used when data is normally transmitted out the main port and needs to be temporarily sent out the aux port. The first EB in a format string opens the aux port, temporarily re-directing data transmission out the aux port. Send commands (F1, F2, F3, F4) are then used to transmit data. A second EB command closes the aux port and resumes normal data transmission through the main port.

E4 Replaces up to 15 characters in the data string with user specified characters. Replacement continues until the E5 command is encountered. ***Syntax = E4nnxx$_1$xx$_2$yy$_1$yy$_2$...zz$_1$zz$_2$*** where nn is the total count of both characters to be replaced plus replacement characters; xx$_1$ defines characters to be replaced and xx$_2$ defines replacement characters, continuing through zz$_1$ and zz$_2$.

E5 Terminates character replacement. ***Syntax = E5***.

FE Compare character in current cursor position to the character "xx." If characters are equal, increment cursor. If characters are not equal, no format match. ***Syntax = FExx*** (xx stands for the hex value for an ASCII code, see Decimal to Hex to ASCII Conversion chart, page 4-14.)

EC Check to make sure there is an ASCII number at the current cursor position. If character is not numeric, format is aborted. ***Syntax = EC***.

ED Check to make sure there is a non-numeric ASCII character at the current cursor position. If character is numeric, format is aborted. ***Syntax = ED***.

EF Inserts a delay of up to 49,995 milliseconds (in multiples of 5). **Syntax = EFnn** where nn is a count of the number 5 ms delays, up to 9,999.

Data Format Editor

See page 4-15 through page 4-17 for a description of Data Format selections and commands.

Enter Data Format

Default Data Format

Clear One Data Format

Clear All Data Formats

Save

Discard

Data Formatter

When Data Formatter is turned off, the bar code data is output to the host as read (including prefixes and suffixes).

*Data Formatter On

Data Formatter Off

Require Data Format

When Data Formatter is required, all input data must conform to an edited format or the base does not transmit the input data to the host device. If this occurs, the scanner triple beeps and the data is discarded.

Data Format Required

*Data Format Not Required

Decode Beep Selection

Note: Decode Beep mode is active only when the programming selections Host ACK (page 3-6) or Data Format Required (page 4-19) are turned on.

When Host Ack Selection is on, the scanner will only beep/blink in response to the Escape commands generated by the host. If you also want the scanner to beep when a bar code has been successfully decoded and successfully communicated to the base, turn the Decode Beep Selection on.

When Data Format Required is on, the scanner will only beep if the input data conforms to the edited format or triple beep if it does not meet the format requirements. Should you also want the scanner to beep when a bar code has been successfully read and sent to the host from the base, turn the Decode Beep Selection on.

On

*Off

Alternate Data Formats

Alternate formats allow you “single shot” capability to scan one bar code using a different data format than your primary format. When data formats are programmed (see page 4-15), you must input whether you are programming the primary format, or an alternate format numbered 1, 2, or 3.

An alternate format is initiated by scanning one of the 3 alternate format bar codes below. The scanner will scan the next bar code, formatting the data with the selected alternate format, then revert immediately to the primary format.

Alternate Data Format 1

Alternate Data Format 2

Alternate Data Format 3

Symbology Menu

Introduction

Use this section to program the cordless system for industrial, retail, and stacked symbology selections.

This programming section contains the following menu selections:

Codabar	Telepen
Code 39	China Post Code
Code 93	Reduced Space Symbology (RSS)
Interleaved 2 of 5	PDF417
Code 2 of 5	MicroPDF417
Matrix 2 of 5	EAN•UCC Composite Symbology
Code 11	EAN
Code 128	UPC

Programming Tip: If a symbology will not be used, we recommend turning it off to maximize decoding speed and security.

Codabar

<Default All Codabar Settings>

Codabar

*On

Off

Start/Stop Characters

Transmit

*Don't Transmit

Codabar, continued

Codabar Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 2-60. Defaults are Minimum = 4, Maximum = 60.

*If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again*

Minimum

Maximum

Codabar, continued

Codabar Check Character

A modulo 16 check character may be encoded in Codabar. Since the symbology does not provide any means to indicate whether the check character was encoded, the reader cannot autodiscriminate. Therefore, the reader must be configured if it is to perform check character validation. Refer to *AIM Uniform Symbology Specification Codabar* for more information.

*No Check Character Encoded

Validate and Transmit Check Character

Validate, but Don't Transmit Check Character

Concatenation

Codabar supports symbol concatenation. When you turn concatenation on, the reader will look for a Codabar symbol having a "D" start character, adjacent to a symbol having a "D" stop character. In this case the two messages are concatenated into one with the "D" characters omitted.

Select **Require** to prevent the reader from decoding a lone Codabar symbol.

Codabar, continued

Concatenation

Concatenation Not Allowed

*Concatenation Allowed, But Not Required

Concatenation Required

Code 39

<Default All Code 39 Settings>

Code 39

*On

Off

Start/Stop Characters

Transmit

*Don't Transmit

Code 39, continued

Code 39 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 0-48. Defaults are Minimum = 0, Maximum = 48.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again

Minimum

Maximum

Code 39, continued

Check Character

A modulo 43 check character may be encoded in Code 39. Since the symbology does not provide any means to indicate whether the check character was encoded, the reader cannot autodiscriminate. Therefore, the reader must be configured if it is to perform check character validation. Refer to *AIM Uniform Symbology Specification Code 39* for more information.

*No Check Character Encoded

Validate and Transmit Check Character

Validate, but Don't Transmit Check Character

Code 39, continued

Full ASCII

If Full ASCII Code 39 decoding is enabled, certain character pairs within the bar code symbol will be interpreted as a single character. For example: $V will be decoded as the ASCII character SYN, and /C will be decoded as the ASCII character #. Default = On.

NUL	%U	DLE	$P	SP	SPACE	0	0	@	%V	P	P	‘	W	p	+P
SOH	$A	DC1	$Q	!	/A	1	1	A	A	Q	Q	a	+A	q	+Q
STX	$B	DC2	$R	“	/B	2	2	B	B	R	R	b	+B	r	+R
ETX	$C	DC3	$S	#	/C	3	3	C	C	S	S	c	+C	s	+S
EOT	$D	DC4	$T	$	/D	4	4	D	D	T	T	d	+D	t	+T
ENQ	$E	NAK	$U	%	/E	5	5	E	E	U	U	e	+E	u	+U
ACK	$F	SYN	$V	&	/F	6	6	F	F	V	V	f	+F	v	+V
BEL	$G	ETB	$W	‘	/G	7	7	G	G	W	W	g	+G	w	+W
BS	$H	CAN	$X	(	/H	8	8	H	H	X	X	h	+H	x	+X
HT	$I	EM	$Y	)	/I	9	9	I	I	Y	Y	i	+I	y	+Y
LF	$J	SUB	$Z	*	/J	:	/Z	J	J	Z	Z	j	+J	z	+Z
VT	$K	ESC	%A	+	/K	;	%F	K	K	[	%K	k	+K	{	%P
FF	$L	FS	%B	,	/L	<	%G	L	L	\	%L	l	+L	|	%Q
CR	$M	GS	%C	-	-	=	%H	M	M	]	%M	m	+M	}	%R
SO	$N	RS	%D	.	.	>	%I	N	N	^	%N	n	+N	~	%S
SI	$O	US	%E	/	/O	?	%J	O	O	_	%O	o	+O	DEL	%T

*On

Off

Code 39, continued

Append

On

*Off

Code 93

<Default All Code 93 Settings>

Code 93

*On

Off

Code 93, continued

Code 93 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 0-80. Defaults are Minimum = 0, Maximum = 64.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again

Minimum

Maximum

Interleaved 2 of 5

<Default All Interleaved 2 of 5 Settings>

Interleaved 2 of 5

*On

Off

Interleaved 2 of 5, continued

Interleaved 2 of 5 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 2-80. Defaults are Minimum = 4, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again

Minimum

Maximum

Interleaved 2 of 5, continued

Check Digit

A modulo 10 check digit may be encoded in Interleaved 2 or 5. Since the symbology does not provide any means to indicate whether the check digit was encoded, the reader cannot autodiscriminate. Therefore, the reader must be configured if it is to perform check digit validation. Refer to *AIM Uniform Symbology Specification Interleaved 2 of 5* for more information.

*No Check Digit Encoded

Validate and Transmit Check Digit

Validate, but Don't Transmit Digit

Code 2 of 5

<Default All Code 2 of 5 Settings>

Code 2 of 5

*On

Off

Code 2 of 5, continued

Code 2 of 5 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 0-80. Defaults are Minimum = 4, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

Matrix 2 of 5

<Default All Matrix 2 of 5 Settings>

Matrix 2 of 5

*On

Off

Matrix 2 of 5, continued

Matrix 2 of 5 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 1-80. Defaults are Minimum = 4, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

Code 11

<Default All Code 11 Settings>

Code 11

*On

Off

Code 11 Check Digits Required

*2 Check Digits

1 Check Digit

Code 11, continued

Code 11 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 1-80. Defaults are Minimum = 4, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

Code 128

<Default All Code 128 Settings>

Code 128

*On

Off

Code 128, continued

Code 128 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum length range = 0-80 and Maximum length range = 0-90. Defaults are Minimum = 0, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

Code 128, continued

<GS> Substitution

A Code 128 FNC1 symbol character may appear in the first or second symbol position to indicate compliance with certain industry standards. If the FNC1 appears in any other symbol position, the reader substitutes a <GS> character (ASCII 1D hex) in the transmitted data. If <GS> Substitution is turned off, the reader ignores all FNC1 characters except those that occur in the first or second symbol position. *Default = On.*

*On

Off

ISBT 128

The International Society of Blood Transfusion (ISBT) ratified a new standard in 1994 for communicating critical blood information in a uniform manner. The *ISBT 128 Application Specification* describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128 that supports concatenation of neighboring symbols, and 4) the standard layout for bar codes on a blood product label.

On

*Off

Telepen

<Default All Telepen Settings>

Telepen

*On

Off

Telepen, continued

Telepen Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 1-60. Defaults are Minimum = 1, Maximum = 60.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

Telepen Output

Telepen has two modes of output: Alphanumeric or Numeric Only. Alphanumeric output complies with AIM guidelines, while Numeric Only is the older, non-compliant, but more common, version of Telepen symbology.

Alphanumeric

*Numeric Only

China Post Code (IT3870 only)

<Default All China Post Code Settings>

China Post Code

On

*Off

China Post Code, continued

China Post Code Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 2-80. Defaults are Minimum = 4, Maximum = 80.

If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.

Minimum

Maximum

RSS-14 (IT3870 only)

Reduced Space Symbology (RSS) is a family of linear bar codes that meets restricted space requirements, while still providing full product identification.

On

*Off

RSS Limited (IT3870 only)

On

*Off

RSS Expanded (IT3870 only)

<Default All RSS Expanded Settings>

On

*Off

RSS Expanded (IT3870 only), continued

RSS Expanded Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 4-74. Defaults are Minimum = 4, Maximum = 74.

*Note: If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.*

Minimum

Maximum

PDF417 (IT3870PDF only)

<Default All PDF417 Settings>

PDF417

*On

Off

PDF417 (IT3870), continued

PDF417 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum length range = 1-1000 and Maximum length range = 1-2750. Defaults are Minimum = 1, Maximum = 2750.

*Note: If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.*

Minimum

Maximum

Show GLI Blocks

Three compaction modes are defined for data that is encoded into a PDF417 symbol. Optionally, a user may devise a new compaction or interpretation method using the Global Label Identifier (GLI) feature of PDF417. This mode is recommended when the host system is capable of interpreting the GLI Block and capable of performing the new interpretation. The GLI Block may occur anywhere in the data, and begins with the escape character '\' (ASCII 5C hex). Any natural occurrence of the '\' in data is replaced by '\\'. When this feature is disabled, the GLI Blocks are not transmitted. *Default = Don't Show GLI Blocks*.

Show GLI Blocks

*Don't Show GLI Blocks

PDF417 (IT3870), continued

Macro PDF417

Macro PDF417 is an optional feature for PDF417 that allows the data from multiple symbols to be combined into a single message. Enabling this feature causes the reader to buffer Macro PDF417 symbols and to assemble them in the correct order, regardless of the order in which the symbols are scanned. When this feature is disabled, the reader transmits the data from each symbol independently, in the order it is scanned. *Default = Buffer*.

*Buffer

Don't Buffer

Show Macro Control Blocks

Turning on this feature causes the Macro PDF Control Block to be transmitted at the end of the encoded data, except when the reader has successfully buffered and assembled each symbol into a single message. The Control Block is transmitted as defined in *AIM Uniform Symbology Specification PDF417* using an escape sequence. The Control Block begins with the escape character '\' (ASCII 5C hex), and any natural occurrence of the '\' in data is replaced by '\\'. This mode is recommended when the host system is capable of interpreting the Control Block. When this feature is disabled, the Control Block is not transmitted. *Default = Don't Show Control Blocks.*

Show Control Blocks

*Don't Show Control Blocks

PDF417 (IT3870), continued

Scan Diagnostics

When Scan Diagnostics is turned on, the scanner sends a report instead of the decoded message. Your terminal displays the diagnostic information first, then the data from the scanned code. *Default = Off*.

On

*Off

The following list shows the information that appears for the PDF417 symbology.

Note: The higher the percentage of unused error correction (UEC), the easier it should be to read each code.

PDF 417: x rows, x cols, xx data & xx chks (ECL = x), UEC = xxx%
Rows = Number of rows
Cols = Number of columns
Data = Number of data words
Chks = Number of check words
ECL = Error Correction Level
UEC = Unused Error Correction

PDF417 Learn Mode

This setting tells the scanner to brighten the LED's when you have an optimal distance between the scanner and the PDF417 code you are attempting to read. Reading distance varies, depending on x-dimension and row height of the symbol. When you turn on the PDF Learn Mode, the IT3870's light becomes brighter when you are at the best distance for reading the PDF417 code. *Default = Off*.

On

*Off

MicroPDF417 (IT3870PDF only)

< Default All MicroPDF417 Settings >

MicroPDF417

On

*Off

MicroPDF417 (IT3870 only), continued

MicroPDF417 Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum and Maximum lengths = 1-366. Defaults are Minimum = 1, Maximum = 366.

*If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.*

Minimum

Maximum

EAN•UCC Composite Symbology (IT3870PDF only)

< Default All EAN•UCC Composite Symbology Settings >

EAN•UCC Composite

Linear codes are combined with a unique 2D composite component to form a new class called EAN•UCC Composite Symbology. EAN•UCC Composite Symbology allows for the co-existence of symbologies already in use.

On

*Off

Enable UPC/EAN Version

Turn on this selection to decode EAN•UCC composite symbols having a UPC or EAN primary component.

On

*Off

EAN•UCC Composite Symbology, continued

EAN•UCC Composite Symbology Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will ignore the symbol and continue scanning. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09 Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15 Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes below, then scan the appropriate value and **Save** bar codes on the Programming Chart inside the back cover. Minimum length range = 1-1000 and Maximum length range = 1-2400. Defaults are Minimum = 1, Maximum = 2400.

*If you make an error while scanning the digits (before scanning Save), scan Discard on the back cover, scan the **Minimum** or **Maximum** bar code, scan the correct digits, and **Save** again.*

Minimum

Maximum

EAN/JAN 8

<Default All EAN/JAN 8 Settings>

EAN/JAN 8

*On

Off

EAN/JAN8 Check Digit

*Transmit

Don't Transmit

EAN/JAN 13

<Default All EAN/JAN 13 Settings>

EAN/JAN 13

*On

Off

EAN/JAN13 Check Digit

*Transmit

Don't Transmit

ISBN

This symbology allows the scanner to read ISBN codes on books.

On

*Off

UPC A

<Default All UPC A Settings>

UPC A

Note: UPC will be transmitted as EAN if UPC is off. UPC is a subset of EAN. To disable UPC, it is necessary to disable both UPC and EAN symbologies.

*On

Off

UPC A, continued

UPC A Check Digit

*Transmit

Don't Transmit

Number System

*Transmit

Don't Transmit

UPC E0

<Default All UPC E0 Settings>

UPC E0

*On

Off

UPC E0 Check Digit

*Transmit

Don't Transmit

Number System

*Transmit

Don't Transfer

UPC E0, continued

Version E Expand

Expand

*Don't Expand

UPC E1

UPC E1 is no longer recommended for use by the Uniform Code Council (UCC).

On

*Off

EAN/UPC Addenda

Require

*Don't Require

EAN Addenda

Two Digit Addenda On

*Two Digit Addenda Off

Five Digit Addenda On

*Five Digit Addenda Off

UPC Addenda

Two Digit Addenda On

*Two Digit Addenda Off

Five Digit Addenda On

*Five Digit Addenda Off

Keyboard Function Relationships

The following Keyboard Function Code, Hex/ASCII Value, and Full ASCII "CTRL"+ relationships apply to all terminals that can be used with the Cordless System.

Function Code	HEX/ASCII Value	Full ASCII "CTRL" +
NUL	00	2
SOH	01	A
STX	02	B
ETX	03	C
EOT	04	D
ENQ	05	E
ACK	06	F
BEL	07	G
BS	08	H
HT	09	I
LF	0A	J
VT	0B	K
FF	0C	L
CR	0D	M
SO	0E	N
SI	0F	O
DLE	10	P
DC1	11	Q
DC2	12	R
DC3	13	S
DC4	14	T
NAK	15	U
SYN	16	V
ETB	17	W
CAN	18	X
EM	19	Y
SUB	1A	Z
ESC	1B	[
FS	1C	\
GS	1D	]
RS	1E	6
US	1F	-

The last five characters in the Full ASCII “CTRL”+ column ([\ ] 6 -), apply to US only. The following chart indicates the equivalents of these five characters for different countries.

Country	Codes				
United States	[	\	]	6	-
Belgium	[	<	]	6	-
Scandinavia	8	<	9	6	-
France	^	8	$	6	=
Germany		Ã	+	6	-
Italy		\	+	6	-
Switzerland		<	. .	6	-
United Kingdom	[	’	]	6	-
Denmark	8	\	9	6	-
Norway	8	\	9	6	-
Spain	[	\	]	6	-

Supported Interface Keys

Supported Interface Keys		IBM AT/XT and PS/2 Compatibles, WYSE PC/AT	IBM XTs and Compatibles	IBM, Telex (122)*
NUL	00	Reserved	Reserved	Reserved
SOH	01	Enter (KP)	CR/Enter	Enter
STX	02	Cap Lock	Caps Lock	F11
ETX	03	ALT make	Reserved	F12
EOT	04	ALT break	Reserved	F13
ENQ	05	CTRL make	Reserved	F14
ACK	06	CTRL break	Reserved	F15
BEL	07	CR/Enter	CR/Enter	New Line
BS	08	Reserved	Reserved	F16
HT	09	Tab	Tab	F17
LF	0A	Reserved	Reserved	F18
VT	0B	Tab	Tab	Tab/Field Forward
FF	0C	Delete	Delete	Delete
CR	0D	CR/Enter	CR/Enter	Field Exit/New Line
SO	0E	Insert	Insert	Insert
SI	0F	Escape	Escape	F19
DLE	10	F11	Reserved	Error Reset
DC1	11	Home	Home	Home
DC2	12	Print	Print	F20
DC3	13	Back Space	Back Space	Back Space
DC4	14	Back Tab	Back Tab	Backfield/Back Tab
NAK	15	F12	Reserved	F21
SYN	16	F1	F1	F1
ETB	17	F2	F2	F2
CAN	18	F3	F3	F3
EM	19	F4	F4	F4
SUB	1A	F5	F5	F5
ESC	1B	F6	F6	F6
FS	1C	F7	F7	F7
GS	1D	F8	F8	F8
RS	1E	F9	F9	F9
US	1F	F10	F10	F10

* Terminal IDs 006, 007, 008 and Telex (models with 122 key keyboards)

Supported Interface Keys

Supported Interface Keys		IBM, Telex (102)*	Telex (88)**	WYSE 85/185 DEC VT***
NUL	00	Reserved	Reserved	Reserved
SOH	01	Enter	Enter	Enter
STX	02	F11	PF10	PF1
ETX	03	F12	PF11	PF2
EOT	04	F13	PF12	PF3
ENQ	05	F14	Reserved	PF11
ACK	06	F15	Reserved	PF12
BEL	07	New Line	New Line	New Line
BS	08	F16	Field Forward	PF4
HT	09	F17	Field Forward	TAB
LF	0A	F18	Reserved	F13
VT	0B	Tab/Field Forward	Field Forward	F14
FF	0C	Delete	Delete	Remove
CR	0D	Field Exit	New Line	New Line
SO	0E	Insert	Insert	Insert Here
SI	0F	Clear	Erase	Cursor Up
DLE	10	Error Reset	Error Reset	Cursor Left
DC1	11	Home	Reserved	Cursor Down
DC2	12	Print	Print	Cursor Right
DC3	13	Back Space	Back Space	Delete
DC4	14	Back Tab	Back Field	Print
NAK	15	F19	Reserved	F15
SYN	16	F1	PF1	F1
ETB	17	F2	PF2	F2
CAN	18	F3	PF3	F3
EM	19	F4	PF4	F4
SUB	1A	F5	PF5	F5
ESC	1B	F6	PF6	F6
FS	1C	F7	PF7	F7
GS	1D	F8	PF8	F8
RS	1E	F9	PF9	F9
US	1F	F10	Home	F10

* Terminal IDs 006, 007, and 008, Telex (all models) with 102 key keyboards

** Memorex Telex with 88 key keyboards

*** DEC VT 220/320/340/420

Supported Interface Keys

Supported Interface Keys		Esprit 200, 400 ANSI	Esprit 200, 400 ASCII	Esprit 200, 400 PC
NUL	00	Reserved	Reserved	Reserved
SOH	01	New Line	New Line	New Line
STX	02	N/A	N/A	N/A
ETX	03	N/A	N/A	N/A
EOT	04	N/A	N/A	N/A
ENQ	05	N/A	N/A	N/A
ACK	06	N/A	N/A	N/A
BEL	07	New Line	New Line	New Line
BS	08	N/A	N/A	N/A
HT	09	Tab	Tab	Tab
LF	0A	N/A	N/A	N/A
VT	0B	Tab	Tab	Tab
FF	0C	N/A	N/A	Delete
CR	0D	New Line	New Line	New Line
SO	0E	N/A	N/A	Insert
SI	0F	Escape	Escape	Escape
DLE	10	F11	F11	F11
DC1	11	Insert	Insert	Home
DC2	12	F13	F13	Print
DC3	13	Back Space	Back Space	Back Space
DC4	14	Back Tab	Back Tab	Back Tab
NAK	15	F12	F12	F12
SYN	16	F1	F1	F1
ETB	17	F2	F2	F2
CAN	18	F3	F3	F3
EM	19	F4	F4	F4
SUB	1A	F5	F5	F5
ESC	1B	F6	F6	F6
FS	1C	F7	F7	F7
GS	1D	F8	F8	F8
RS	1E	F9	F9	F9
US	1F	F10	F10	F10

Supported Interface Keys

Supported Interface Keys		Bull BDS-7 (Honewell HDS-7)	WYSE WY-60/150	WYSE WY-30
NUL	00	Reserved	Reserved	Reserved
SOH	01	Transmit	New Line	Enter
STX	02	Reserved	Insert/PF1	Reserved
ETX	03	Reserved	Delete/PF2	Reserved
EOT	04	Reserved	Clear/PF3	Reserved
ENQ	05	Back Tab	F11	Reserved
ACK	06	Reserved	F12	Reserved
BEL	07	Carriage Return	New LIne	Return
BS	08	Back Space	Replace/PF4	Reserved
HT	09	Tab	Tab Forward	Tab
LF	0A	F11	F13	Line Feed
VT	0B	F12	F14	Reserved
FF	0C	Delete Character	F15	Reserved
CR	0D	Carriage Return	New Line	Carriage Return
SO	0E	Insert	Insert	Reserved
SI	0F	Clear	Cursor Up	Cursor Up
DLE	10	Error Reset	Cursor Left	Cursor Left
DC1	11	Home	Cursor Down	Cursor Down
DC2	12	Delete Line	Cursor Right	Cursor Right
DC3	13	Erase EOP	Back Space	Back Space
DC4	14	Erase EOF	Print	Reserved
NAK	15	Insert Line	F16	Reserved
SYN	16	F1	F1	F1
ETB	17	F2	F2	F2
CAN	18	F3	F3	F3
EM	19	F4	F4	F4
SUB	1A	F5	F5	F5 (CTRL F1)
ESC	1B	F6	F6	F6 (CTRL F2)
FS	1C	F7	F7	F7 (CTRL F3)
GS	1D	F8	F8	F8 (CTRL F4)
RS	1E	F9	F9	F9 (SHIFT F2)
US	1F	F10	F10	F10 (SHIFT F3)

SCANTEAM 2070 Cordless Base Product Specifications

Parameter	Specification
Dimensions	
Height	1.4 inches (3.6 cm)
Width	4.0 inches (10.2 cm)
Length	4.5 inches (11.5 cm)
Weight	7.25 ounces (206 g) without cable
LED Indicators	One
Beeper	None
Operating Voltage	+4.0 to 14.0 VDC
Power Consumption	
Standard Mode	285 mA (typical) @ 5 VDC
Low Power Mode	140 mA (typical) @ 5 VDC
Noise Immunity	100 mV peak to peak
Temperature Ranges	
Operating	-4° F to 122° F (-20° C to +50° C)
Storage	-40° F to +158° F (-40° C to +70° C)
Humidity	0 to 95% relative humidity (non-condensing)
Housing Material	GE Cycloloy C2800 or C2950 Standard Flow
Sealing	IP 53 (Water and Dust Resistant)
Mechanical Shock	26 drops from 4 feet (1.2 m) to concrete
ESD Sensitivity	15 kV to any external surface
Reliability	MTBF = 50,000 hours (ground benign)

Radio Specifications

Parameter	*Specification*
Frequency	2.400 to 2.4835 Ghz (ISM Band) Frequency-Hopping Spread Spectrum
Data Rates	1 Mbps
Response Time	
Standard Mode	10 mS Typical
Low Power Mode	65 mS Typical
# of co-existing systems	20

IMAGETEAM 3870 Cordless Linear Imager Scanner Product Specifications

Parameter	*Specification*
Dimensions	
Height	8.5 inches (21.6 cm) (with charge pack)
Width	3.2 inches (8.1 cm)
Length	4.7 inches (11.9 cm)
Weight	16 ounces (448 g) with charge pack (CLESS/NIMH/S or 34/5770/NIMH/S)
Light Source	620 to 640 nm Visible Red Light Emitting Diodes (LED)
Print Contrast	Minimum Reflective Difference = 37.5%
Scan Rate	270 scans per second
LED Indicators	One (3 colors)
Beeper	Volume and tone programmable
Skew Angle	± 30 degrees from perpendicular
Pitch Angle	± 15 degrees left/right from perpendicular
Operating Voltage	+4.2 to 6.0 VDC
Power Consumption	
Operating	350 mA (typical) while scanning
Standby	15 mA
Battery Conservation Mode	10 mA
Ambient Light	Total darkness to 100,000 Lux (sunlight)
Noise Immunity	100 mV peak to peak
Temperature Ranges	
Operating	+32° F to +122° F (0° C to +50° C)
Storage	-22° F to +140° F (-30° C to +60° C)
Humidity	5 to 95% relative humidity (non-condensing)
Altitude	Sea level to 9,900 feet (3000 meters)
Housing Material	GE Cycloloy C2800 or C2950 Standard Flow
Sealing	IP 54 (Water and Dust Resistant)
Mechanical Shock	26 drops from 6 feet (1.8 m) to concrete
ESD Sensitivity	15 kV to any external surface

SCANTEAM 5770 Cordless Laser Scanner Product Specifications

Parameter	*Specification*
Dimensions	
Height	8.3 inches (21 cm) (with charge pack)
Width	3.1 inches (7.8 cm)
Length	4.7 inches (11.9 cm)
Weight	18 ounces (510 g) with charge pack
Light Source	630 to 670 nm Visible Laser Diode (VLD)
Scan Rate	33±3 scans per second (laser scan engine)
Print Contrast	Minimum Reflective Difference = 40%
LED Indicators	Two (2)
Beeper	Yes (volume programmable)
Skew Angle	±65 degrees (from perpendicular): 5770STD & HV ±60 degrees (from perpendicular): 5770ALR & HD
Pitch Angle	± 55 degrees (left/right from perpendicular): 5770STD & HV ±65 degrees (left/right from perpendicular): 5770ALR & HD
Operating Voltage	+4.3 to 6.0 VDC
Power Consumption	
Operating	400 mA (maximum) @4.8 VDC
Standby	21 mA
Battery Conservation Mode	4 mA
Ambient Light	Total darkness to 100,000 Lux (sunlight)
Noise Immunity	100 mV peak to peak
Temperature Ranges	
5770STD, 5770HV, 5770ALR	Operating: -4° F to +122° F (-20° C to +50° C) Storage: -22° F to +158° F (-30° C to +70° C)
5770HD	Operating: -4° F to +104° F (-20° C to +40° C) Storage: -22° F to +140° F (-30° C to +60° C)
Humidity	5 to 95% relative humidity (non-condensing)
Altitude	Sea level to 9,900 feet (3000 meters)
Housing Material	GE Cycloloy C2800 or C2950 Standard Flow
Sealing	IP 54 (Water and Dust Resistant)
Mechanical Shock	26 drops from 6 feet (1.8 m) to concrete
ESD Sensitivity	15 kV to any external surface

Charge Pack Specifications (CLESS/NIMH/S and 34/5770/ NIMH/S)

The battery is a rechargeable Nickel Metal Hydride (NiMH) pack that, when fully charged, provides over 18,000 scans or 25 hours of continuous use. The unique design of the battery allows the charge pack to be directly charged in a two prong 120 volt wall outlet commonly used in North America. For other parts of the world with different voltages and frequencies, a universal charge strip is needed. While the charge pack may be charged directly with 240 volts, the universal charge strips provide the method to physically adapt to the various power plug and socket configurations.

The charge pack has an LED indicator that displays charging and fully-charged conditions. To condition a new battery, we recommend fully charging and discharging the pack approximately two times so it can reach its full-rated capacity and is conditioned for full capacity and longer life. (See "Charge Pack Recommendations" on page 1-3.)

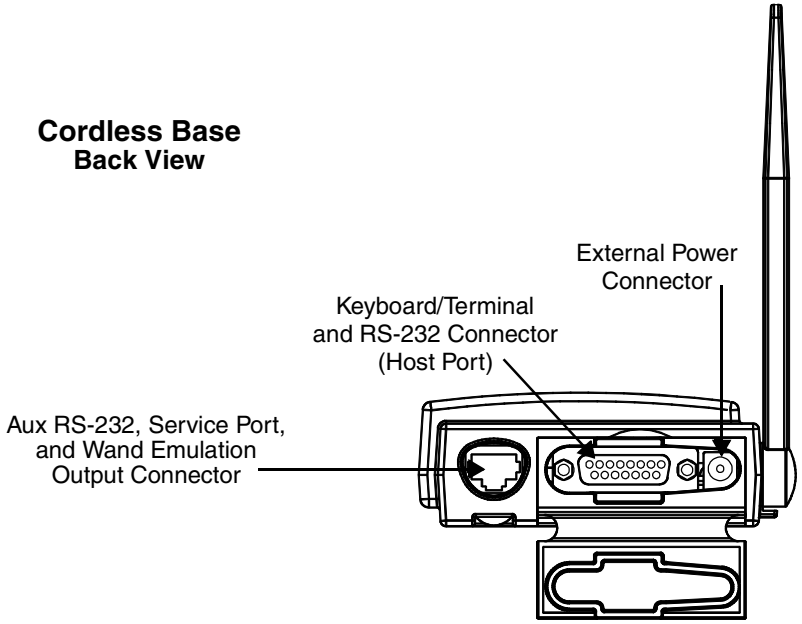
Parameter	*Specification*
Battery Charging (Input) Voltage	85 to 264 VAC @47 to 63 Hz
Capacity	1200 mAh
Number of scans between charges	18,000
Expected hours of operations at 1 scan every 5 seconds	25 hours
Charge time from full discharge to full charge	6 hours
Capacity after 500 charges/discharge cycles	80%
# of mechanical contact insertions	6000

Recommended Storage

Storage Time	Storage Temperature
Up to a month	-4° F to +131° F (-20° C to +55° C)
Up to 3 months	-4° F to +113° F (-20° C to +45° C)
Up to a year	-4° F to +95° F (-20° C to +35° C)
Longer than a year	+50° F to +77° F (+10° C to +25° C)

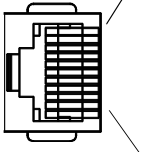
Note: When storing a charge pack for longer than 6 months, recharge at least once a year (once every 6 months if possible) to prevent self-discharge from causing a drop in battery performance, or electrolyte leakage.

Cordless Base
Back View



The auxiliary RS-232/scanner connector supports wand emulation or the attachment of an RS-232 input device. The Aux port is compatible with all Hand Held Products' contact and non-contact bar code scanners, including bar code contact wands, lasers, and linear imagers which operate in RS-232 (TTL and True).

Aux RS-232 Connector: 10 Pin Modular Receptacle



1 Power/Signal Ground
2 Transmit Data (output)
3 Receive Data (input)
4 Request to Send (output)
5 Clear to Send
6 5 Volt DC Power Out
7 WANDEM TTL Wand Data (output)
8 Power into Aux
9 12V Flash Radio (input)
10 No connection

Communications Parameters

For AUX RS-232 Port

Start Bit	1
Data Bits	7 or 8
Stop Bits	1 or 2
Parity	None, Mark, Space, Odd, or Even
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400

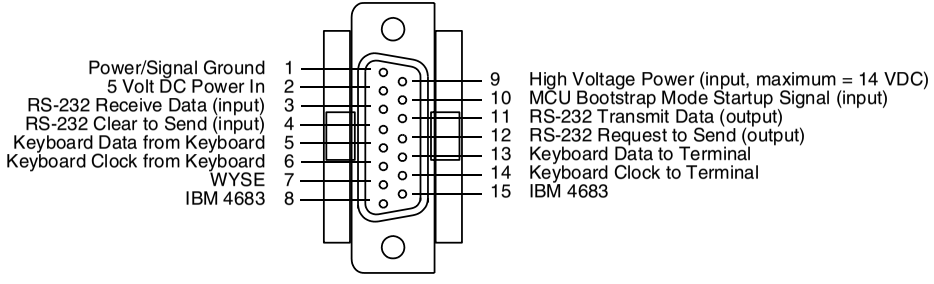
Wand Emulation Mode

When the Base is configured for Wand Emulation, the Aux port will output wand emulation data on Pin 7 at the selected rates/polarity described on page 2-12 or in the Plug and Play section, page 2-2.

The cordless Base can output data to keyboard wedge terminals, CRT terminals, and personal computers. The Base also provides direct RS-232 output.

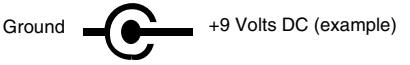
Terminal selection may be programmed using Chapter 1, the Plug and Play (page 2-2) or Terminal Interface selections (page 2-5). Output data can be configured for your application by using the System Manual, Chapters 2 through 4 (Output Parameters, General Operating, and Symbology Menus).

Keyboard/Terminal and RS-232 (Host Port) Connector: DB-15 Pin Female

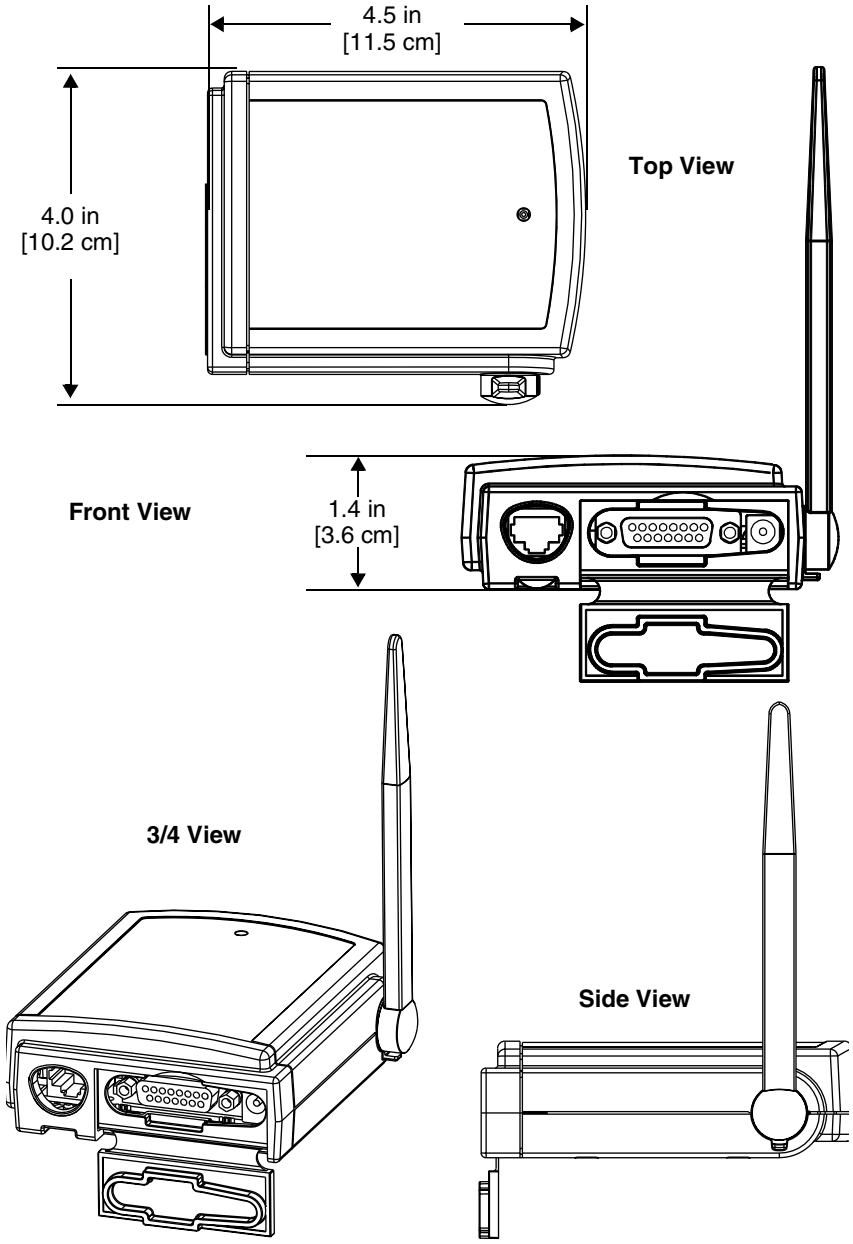

Power/Signal Ground 1
5 Volt DC Power In 2
RS-232 Receive Data (input) 3
RS-232 Clear to Send (input) 4
Keyboard Data from Keyboard 5
Keyboard Clock from Keyboard 6
WYSE 7
IBM 4683 8
9 High Voltage Power (input, maximum = 14 VDC)
10 MCU Bootstrap Mode Startup Signal (input)
11 RS-232 Transmit Data (output)
12 RS-232 Request to Send (output)
13 Keyboard Data to Terminal
14 Keyboard Clock to Terminal
15 IBM 4683

External Power Connector

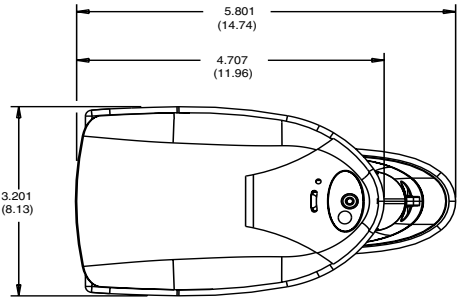
DC power to the cordless Base can come from an external power supply or from the terminal to which the Base is connected. External power is provided through a two-position barrel-type connector on the Base's back panel. The input voltage range is 4 VDC to 14 VDC and the schematic diagram is shown below.



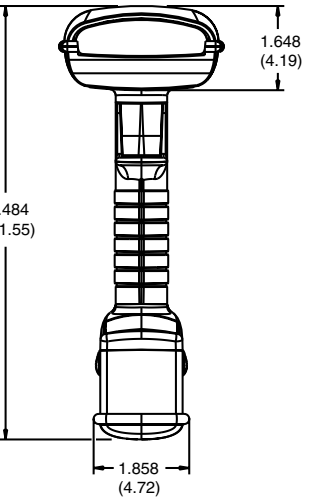
Cordless Base Dimensions - ST2070



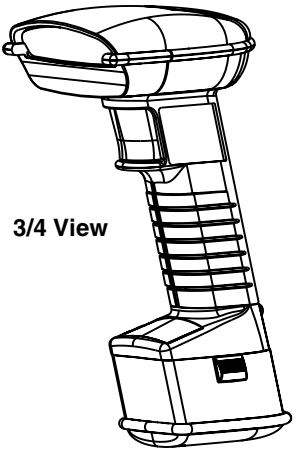
Cordless Scanner Dimensions - IT3870



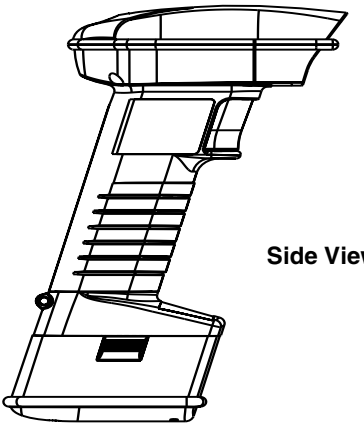
Top View



Front View

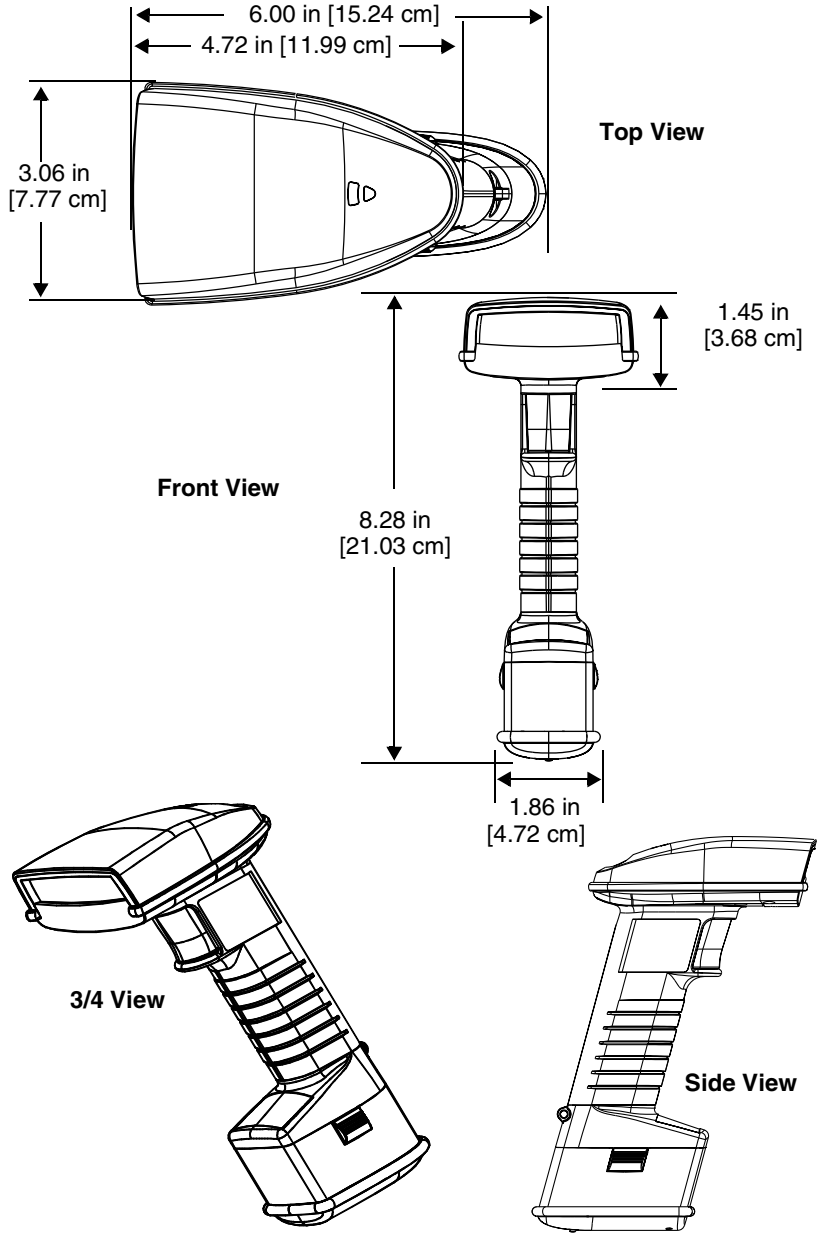


3/4 View



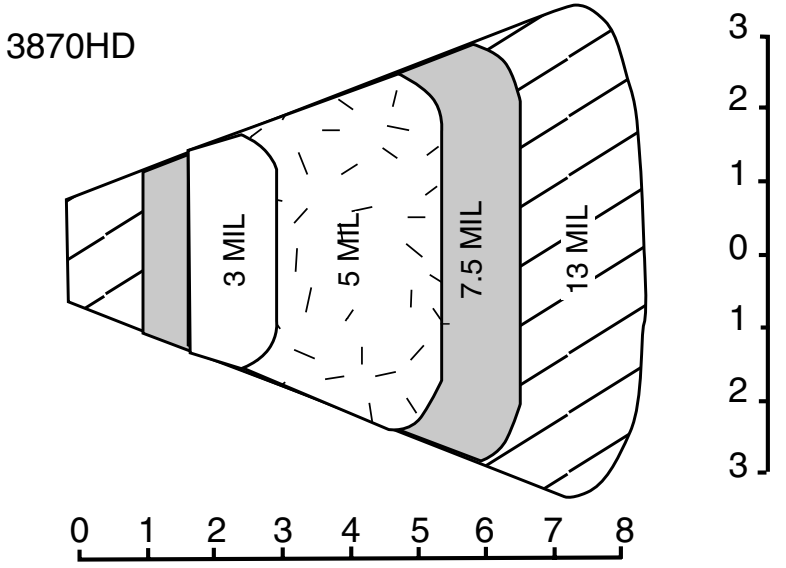
Side View

Cordless Scanner Dimensions - ST5770



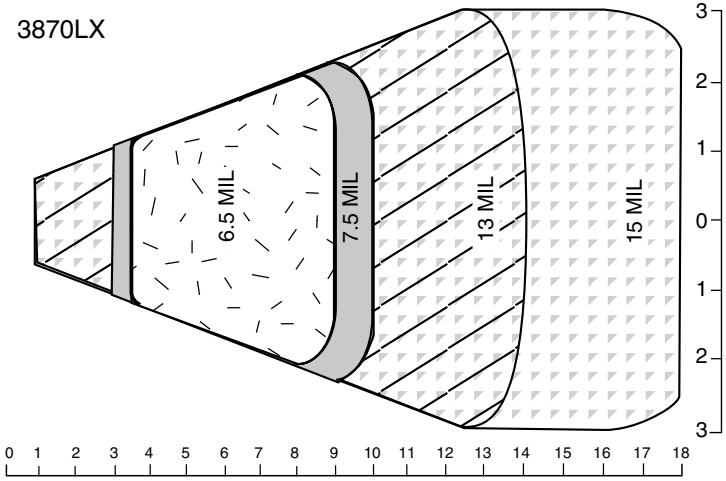
Scan Maps - IT3870

Typical Performance at 20° C for IMAGETEAM 3870HD (measured in inches)

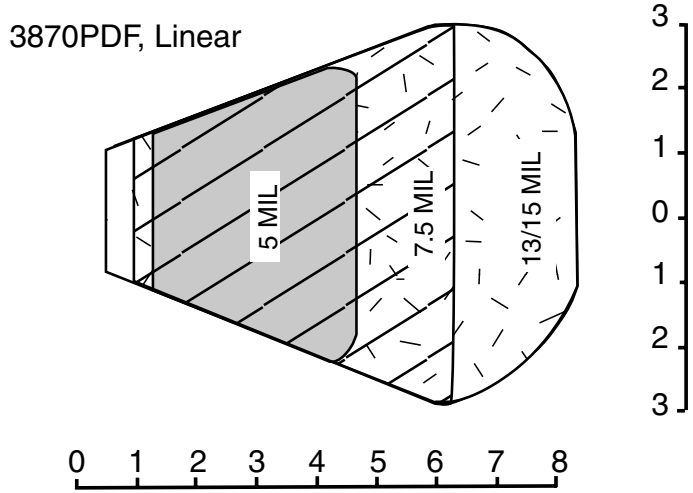


Scan Maps - IT3870

Typical Performance at 20° C for IMAGETEAM 3870LX (Measured in inches)

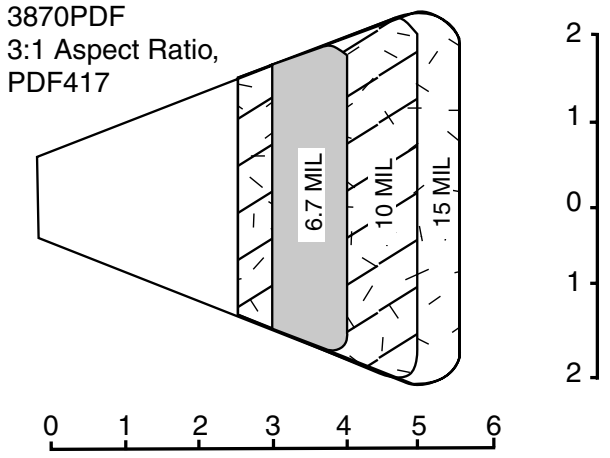


Typical Performance at 20° C for IMAGETEAM 3870PDF, Linear (Measured in inches)



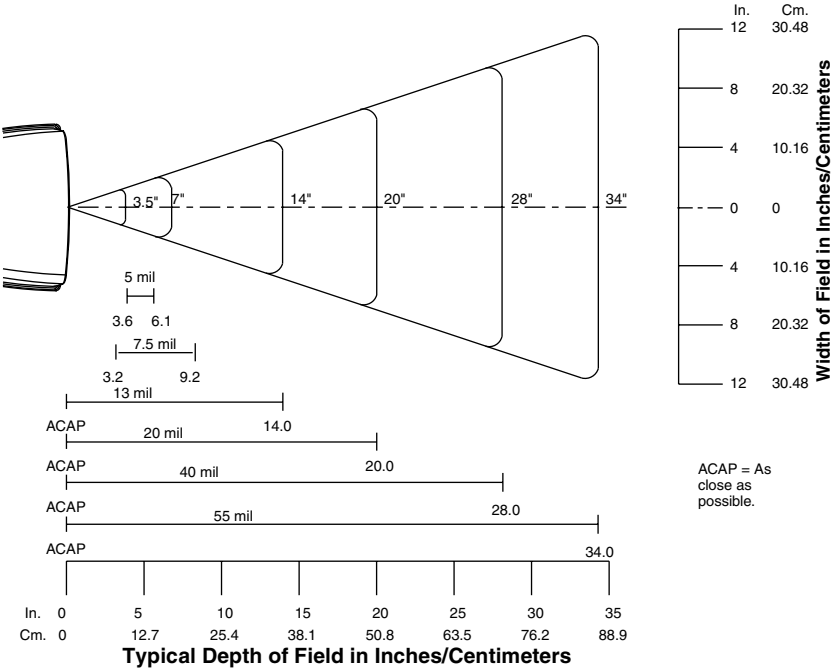
Scan Maps - IT3870

Typical Performance at 20° C for IMAGETEAM 3870PDF417 (Measured in inches)

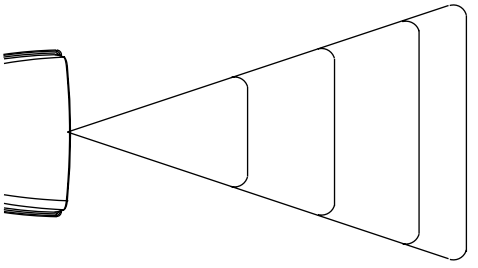


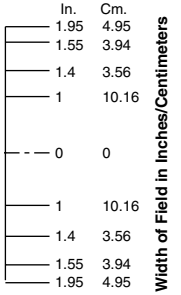
Scan Maps - ST5770

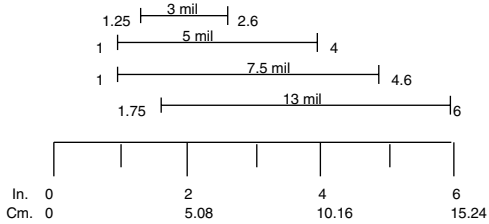
Typical Performance at 20° C for SCANTEAM 5770STD



Scan Maps - ST5770
Typical Performance at 20° C
for SCANTEAM 5770HD

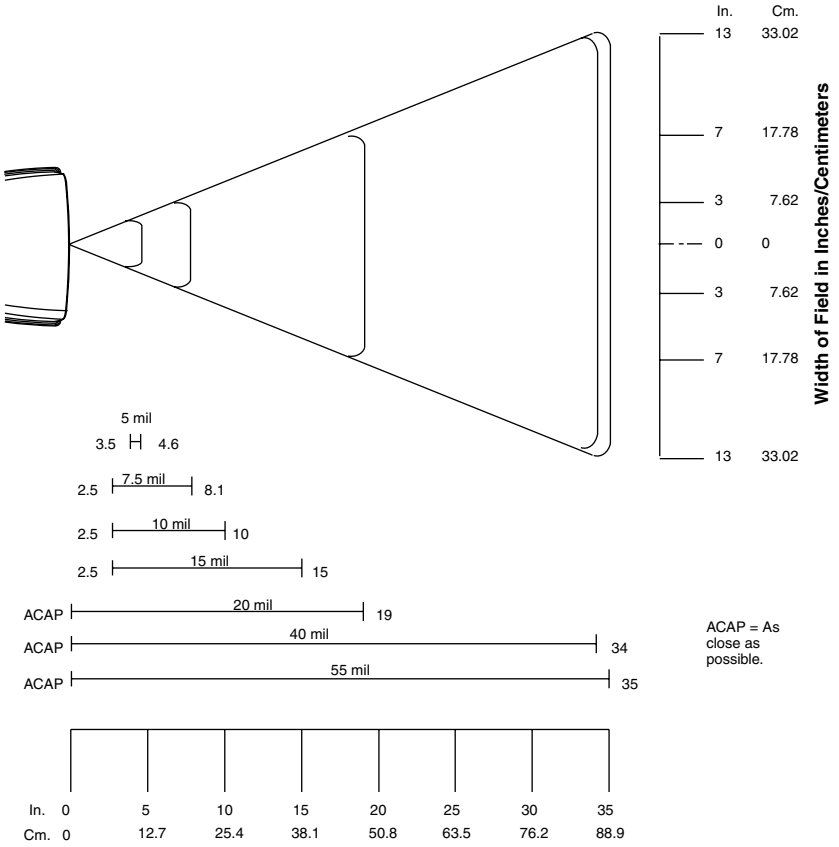






Typical Depth of Field in Inches/Centimeters

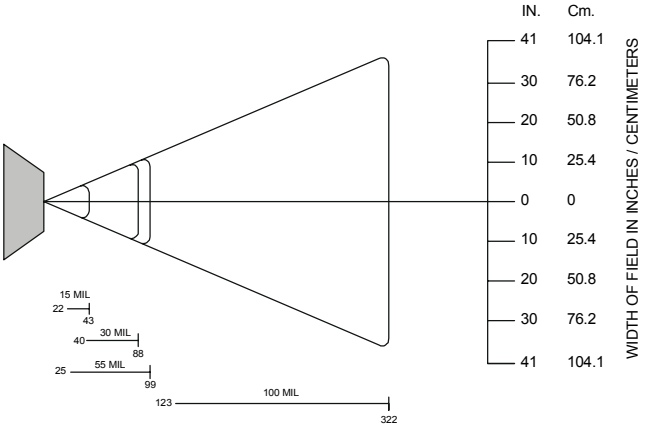
Scan Maps - ST5770
Typical Performance at 20° C
for SCANTEAM 5770HV

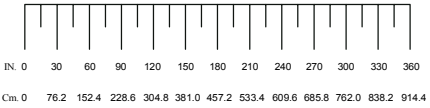


Typical Depth of Field in Inches/Centimeters

Scan Maps - ST5770

TYPICAL PERFORMANCE AT 20° C FOR
SCANTEAM 5770 ALR





TYPICAL DEPTH OF FIELD IN INCHES / CENTIMETERS

Maintenance

Warning:

Do not submerge the cordless scanner or the cordless base in water. Their housings are not water-tight.

Do not use abrasive wipers or tissues on the scan window: abrasive wipers may scratch the window.

Never use solvents (alcohol or acetone) on the housings or the window: solvents may damage the finish or the window.

Do not open the cordless scanner or the cordless base. There are no serviceable parts inside.

The cordless scanning system provides reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks ensure dependable operation:

Cleaning the Scan Window of the Cordless Scanner

Scanning performance may degrade if the cordless scanner's scan window is not clean. If the window is visibly dirty, or if the scanner isn't scanning well, clean the scan window with a soft cloth or facial tissue dampened with water (or a mild detergent-water solution). If a detergent solution is used, rinse with a clean tissue dampened with water only.

The cordless scanner and base housings may also be cleaned the same way.

Inspecting Cords and Connectors

Inspect the cordless base's interface cable and connector for wear or other signs of damage. A badly worn cable or damaged connector may interfere with operation. Contact your Hand Held Products distributor for information about cable replacement. Cable replacement instructions are on page 8-2.

Examining the Cordless Scanner and Cordless Base Housings

Routinely examine the cordless scanner and cordless base housings for signs of damage. A damaged housing may cause the internal components to move and may result in a malfunctioning unit.

Care and Handling of the Charge Pack

Proper handling of the batteries while recharging extends the useful life of the batteries. New charge packs are shipped uncharged. In order to break in the new battery, we suggest that you fully charge and discharge the packs two times so they can be conditioned for full capacity and longer life.

If the charge pack is left plugged in for extended periods of time (for instance, several weeks) the contacts between the prongs may become dirty, causing charging problems. Clean the prongs with a cotton swab and rubbing alcohol to remove any accumulation of dirt.

Replacing the Interface Cable

The standard host interface cable is attached to the cordless base with a 15-pin D-type receptacle connector. Tighten the holding screws to properly seat the interface connector. The cable is designed to be field replaceable.

Auxiliary Port cables use a 10-position modular plug. To remove the Aux Port cable, depress the dimple located on the bottom of the base unit underneath the Aux Port and pull the cable from the unit.

Note: Order replacement cables from Hand Held Products or from an authorized distributor.

When ordering a replacement cable, specify the cable part number of the original interface cable.

Recharging and Replacing the Cordless Scanner's Charge Pack

To maintain the maximum charge capacity, batteries should be allowed to fully discharge prior to charging. It is recommended that you establish a process where a battery is used until it is fully discharged and fully charged before its next use. See "Charging Your Charge Pack" on page 1-4 for instructions on recharging and replacing the cordless scanner charge pack.

To Reset Factory Settings

If you are unsure of the programming options that have been set up in your cordless system, or you've changed some options and now want the factory settings restored, refer to "Reset Factory Settings" on page 2-17 and scan the appropriate **Factory Default Settings** bar code.

Troubleshooting

The cordless system automatically performs self-tests whenever you turn it on. If your cordless scanner or cordless base is not functioning properly, review the following Troubleshooting Guide to isolate the problem.

Troubleshooting Guide

Is the power on? Is the Scanner's red illuminated beam on?

If the red scan beam on the cordless scanner isn't illuminated, check that:

1. the charge pack is connected properly to the cordless scanner.
2. the charge pack is not low on power (check the low battery LED).

Is the cordless system having trouble reading your bar codes?

If the cordless system isn't reading bar codes well, check that:

1. the bar codes aren't smeared, rough, scratched, or exhibiting voids.
2. the bar codes aren't coated with frost or water droplets on the surface.
3. the bar code symbology is enabled (see Chapter 5*, Symbology Menu*).
4. the cordless scanner window is clean.

Is the bar code displayed but not "entered"?

The bar code is displayed on the host device correctly, but you still have to press a key to enter it (*the Enter/Return key or the Tab key, for example*).

You need to program a suffix.

Programming a suffix enables the cordless system to output the scanned bar code *plus* the key you need (such as a "CR" carriage return) to enter the bar code into your application. (See *Suffix Selection in Chapter 4, Application Work Group Menu*.)

Does the cordless system read your bar code incorrectly?

If the cordless system reads a bar code (*one beep for a good read*), but the bar code is not displayed correctly on the host screen:

1. The cordless system may not be programmed for the appropriate terminal interface.

   Example: You scan "*12345* " and the host displays "*@es%*".

   Reprogram the cordless system with the correct "Plug and Play" or Terminal Selection bar code (*see Chapter 1*).

2. The cordless system may not be programmed to output your bar code properly.

   Example: You scan "*12345*" and the host displays "*A12345B*".

Reprogram the cordless system with the proper Symbology selections (*see Chapter 5, Symbology Menu*).

The cordless system won't read your bar code at all?

If the cordless system will not read your bar code:

1. Try scanning the Sample Bar Codes (found near the back of this manual).

   If the cordless system reads the Sample Bar Codes, check that your bar code is readable. (*See "Is the cordless system having trouble reading your bar codes?" on page 8-3*.)

   Verify that your bar code symbology is enabled. (*See* Chapter 5*, Symbology Menu*.)

   If the cordless system does not read the Sample Bar Codes either, continue to #2, below.

2. If the cordless system won't read the Sample Bar Codes either:

   Verify that the bar code symbologies are enabled. (Chapter 5*, Symbology Menu*.)

   Scan the "Default All..." bar code on each symbology menu page in Chapter 5*, Symbology Menu* to enable most symbologies.

Obtaining Factory Service

Hand Held Products provides service for all its products through a service center located at its manufacturing facilities in Skaneateles, New York. To obtain warranty or non-warranty service, return the unit to Hand Held Products (postage paid) with a copy of the dated purchase record attached.

In the United States, please contact the Hand Held Products' Product Service Department at the address/telephone number listed below to obtain a Return Material Authorization number (RMA #).

Main Office
Welch Allyn Data Collection, Inc. (d/b/a Hand Held Products)

4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187

Product Service Department
Telephone: (315) 685-4278 *or* 685-4360
Fax: (315) 685-4156

For service in Europe, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

European Office
Hand Held Products, Ltd.

Hondsruglaan 87 D
5628 DB Eindhoven
The Netherlands

Telephone: Int+ 31 40 242 4486
Fax: Int+ 31 40 242 5672

United Kingdom Office
Hand Held Products (UK) Ltd.

Dallam Court
Dallam Lane
Warrington
Cheshire WA2 7LT
United Kingdom

Telephone: Int+44 (0) 1 925 240055
or Int+353 1 216 0070
Fax: Int+44 (0) 1 925 631280
or Int+353 1 295 6353

For service in Asia, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Asia/Pacific Office
Hand Held Products

10/F Tung Sun Commercial Centre
194-200 Lockhart Road
Wanchai, Hong Kong

Telephone: Int+852-2511-3050 *or* 2511-3132
Fax: Int+852-251-1355

For service in Japan, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Japan Office
Hand Held Products

Bon Marusan 8F
3-5-1 Kanda-Jinbocho
Chiyoda-ku
Tokyo 101, Japan

Telephone: Int+81-3-5212-7392
Fax: Int+81-3-3261-7372

For service in Latin America, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Latin America Office
Hand Held Products

5150 North Tamiami Trail
Suite 302
Naples, FL 34103-2821

Telephone: (941) 263-7600
Fax: (941) 263-9689

Help Desk

If, after reviewing the Troubleshooting Guide (page 8-3), you still need assistance installing or troubleshooting your scanner, please call your Distributor or the nearest Hand Held Products technical support office:

North America:

Telephone: (315) 685-2476 (8 a.m. to 6 p.m. EST)
Fax number: (315) 685-4960
E-mail: *support@handheld.com*

Europe:

Telephone-
European Ofc: Int+31 40 242 4486
U.K. Ofc: Int+44 1925 240055
E-mail: *support@handheld.com*

Asia:
Telephone: Int+852-2511-3050 *or* 2511-3132
E-mail: *support@handheld.com*

Limited Warranty

Welch Allyn Data Collection, Inc. (d/b/a Hand Held Products), hereby warrants its products to be functional and free from manufacturing defects at the time of delivery. Hand Held Products further warrants that it will replace or repair, at its option, any unit that fails to perform according to Hand Held Products' published specifications during a specified duration (see chart below) from the time of shipment by Hand Held Products to the user at the time it is purchased from any of Hand Held Products' Authorized Distributors. Any attempt on the part of the user to disassemble or service the equipment shall void the warranty.

The warranty does not apply to product which have been damaged by improper handling, shipping, or misuse. The warranty does not apply, if, in the sole opinion of Hand Held Products, the unit has been damaged by accident, misuse, neglect, improper shipping and handling. Since the unit is sensitive to static, the responsibility to protect it from static damage is solely that of the user. The warranty is valid only if the unit or scanner has not been tampered with or serviced by any party unauthorized by Hand Held Products as a repair facility.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE OR RELIED UPON WITH RESPECT TO THE QUALITY AND FUNCTION OF THE CORDLESS SYSTEM HEREIN SOLD.

In no event shall Hand Held Products or its resellers be liable for any loss, inconvenience or damage whether direct, incidental, consequential or otherwise, and whether caused by negligence or other fault resulting from the breach of any express warranty except as set forth herein. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state or country to country.

Limited Warranty Durations

IT3870	ST5770	ST2070	CLESS/NIMH/S or 34/5770/ NIMH/S Charge Packs
3 Years	3 Years	3 Years	1 Year

10 Default Chart

The following chart lists the factory default settings (indicated by an asterisk (*) on the programming pages).

Parameter	Default Setting	Page
Country Code Selections		
Keyboard Country	United States	2-8
Keyboard & Delays Selection		
Keyboard Style	Regular	2-9
Keyboard Style Modifiers	Control + ASCII Mode Off	2-10
	Turbo Mode Off	2-10
	Numeric Keypad Mode Off	2-10
	Auto Direct Connect Off	2-11
Output Delays		
Intercharacter Delay	00 (x5mS)	2-11
Interfunction Delay	00 (x5mS)	2-11
Intermessage Delay	00 (x5mS)	2-11
Wand Emulation Selections		
Transmission Rate	25 ips	2-12
Output Polarity	Black High	2-13
Power Settings		
Base Low Power Mode	Off	2-14
Battery Conservation Mode	No Timeout	2-15
Host Port Communications		
Baud Rate	38400	3-2
Parity	None	3-3

Parameter	Default Setting	Page
Word Length Data Bits	8	3-3
Word Length Stop Bits	1	3-4
Hardware Flow Control	Off	3-7
Serial Wedge Output	None (RS-232)	3-5
Host ACK	Off	3-7
Decode Beep	Off	3-10
Auxiliary Port Communications		
Baud Rate	38400	3-11
Parity	None	3-12
Word Length Data Bits	8	3-12
Word Length Stop Bits	1	3-13
Hardware Flow Control	Off	3-13
Protocol	Record	3-15
Data Character		
SOR (Start of Record)	00 (NUL)	3-16
EOR (End of Record)	0D (CR)	3-16
SOB (Start of Block)	00 (NUL)	3-16
EOB (End of Block)	04 (EOT)	3-16
Aux Prefix/Suffix		
Aux Prefix (Incoming Data)	None	3-17
Aux Suffix (Incoming Data)	None	3-17
Aux Prefix (Outgoing Data)	None	3-17
Aux Suffix (Outgoing Data)	CR	3-17
Aux Prefix (On/Off)	On	3-21
Aux Suffix (On/Off)	On	3-21

Parameter	Default Setting	Page
Aux Port I.D. Transmit	Off	3-21
Aux Data Formatter		
Aux Data Formatter	On	3-26
Aux Data Format Required	Not Required	3-27
Output Selections (User Feedback)		
Application Work Group	Group 0	4-2
Beeper Volume	High	4-3
Beeper Pitch	Medium	4-4
Scanner Voting	Voting Normal	4-5
Laser Marker Beam	Off	4-5
AIM I.D. Prefix	Off	4-6
Code I.D. Prefix	Off	4-6
Prefix/Suffix Selections		
Prefix	None	4-11
Suffix	CR	4-11
Prefix On/Off	On	4-13
Suffix On/Off	On	4-13
Data Formatter Selections		
Data Formatter	On	4-18
Require Data Format	Not Required	4-19
Decode Beep	Off	4-20
Codabar Selections		
Codabar	On	5-2
Start/Stop Characters	Don't Transmit	5-2

Parameter	Default Setting	Page
Codabar Message Length	Min = 4, Max = 60	5-3
Check Character	No Check Character Encoded	5-4
Concatenation	Allowed, But Not Required	5-5
Code 39 Selection		
Code 39	On	5-6
Start/Stop Characters	Don't Transmit	5-6
Code 39 Message Length	Min = 0, Max = 48	5-7
Check Character	No Check Character Encoded	5-8
Full ASCII	On	5-9
Append	Off	5-10
Code 93 Selection		
Code 93	On	5-11
Code 93 Message Length	Min = 0, Max = 64	5-12
Interleaved 2 of 5 Selection		
Interleaved 2 of 5	On	5-13
Interleaved 2 of 5 Message Length	Min = 4, Max = 80	5-14
Check Digit	No Check Digit Encoded	5-15
Code 2 of 5 Selection		
Code 2 of 5	On	5-16
Code 2 of 5 Message Length	Min = 4, Max = 80	5-17
Matrix 2 of 5 Selection		
Matrix 2 of 5	On	5-18
Matrix 2 of 5 Message Length	Min = 4, Max = 80	5-19
Code 11 Selection		

Parameter	Default Setting	Page
Code 11	On	5-20
Check Digits Required	2 Check Digits	5-20
Code 11 Message Length	Min = 4, Max = 80	5-21
Code 128 Selection		
Code 128	On	5-22
Code 128 Message Length	Min = 0, Max = 80	5-23
<GS> Substitution	On	5-24
ISBT128	Off	5-24
Telepen Selection		
Telepen	On	5-25
Telepen Message Length	Min = 1, Max = 60	5-26
Telepen Output	Numeric Only	5-26
China Post Code Selection		
China Post Code	Off	5-27
China Post Code Message Length	Min = 4, Max = 80	5-28
RSS-14 Selection		
RSS-14	Off	5-29
RSS Limited	Off	5-29
RSS Expanded	Off	5-29
RSS Message Length	Min = 4, Max = 74	5-30
PDF417 Selection		
PDF417	On	5-31
PDF417 Message Length	Min = 1, Max = 2750	5-32
Show GLI Blocks	Don't Show GLI Blocks	5-33

Parameter	Default Setting	Page
Macro PDF417	Buffer	5-34
Show Macro Control Blocks	Don't Show Control Blocks	5-34
Scan Diagnostics	Off	5-35
PDF Learn Mode	Off	5-35
MicroPDF417 Selection		
MicroPDF417	Off	5-36
MicroPDF417 Message Length	Min = 1, Max = 366	5-37
EAN•UCC Composite Symbology Selection		
EAN•UCC Composite Symbology	Off	5-38
Enable UPC/EAN Version	Off	5-38
EAN•UCC Composite Symbology Message Length	Min = 1, Max = 2400	5-39
EAN / JAN 8 Selection		
EAN / JAN 8	On	5-40
Check Digit	Transmit	5-40
EAN / JAN 13 Selection		
EAN / JAN 13	On	5-41
Check Digit	Transmit	5-41
ISBN	Off	5-41
UPC A Selection		
UPC A	On	5-42
Check Digit	Transmit	5-43
Number System	Transmit	5-43
UPC E0 Selection		

Parameter	Default Setting	Page
UPC E0	On	5-44
Check Digit	Transmit	5-44
Number System	Transmit	5-44
Version E Expand	Don't Expand	5-45
UPC E1 Selection		
UPC E1	Off	5-45
EAN/UPC Addenda Selection		
EAN/UPC Addenda	Don't Require	5-46
EAN Two Digit Addenda	Off	5-46
EAN Five Digit Addenda	Off	5-46
UPC Two Digit Addenda	Off	5-47
UPC Five DIgit Addenda	Off	5-47

Sample Symbols

UPC A

0 123456 7890

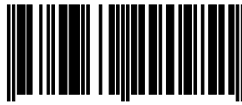
Interleaved 2 of 5

1234567890

Code 128

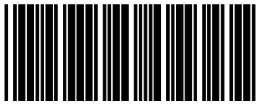
Code 128

EAN 13



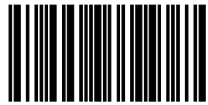
9 780330 290951

Code 39



BC321

Codabar



A13579B

Code 11 with 2 Check Characters

0123456789

Sample Symbols

PDF417

PDF417 Test Message

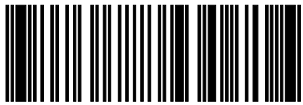
MicroPDF417

MicroPDF417 Test Message

Matrix 2 of 5

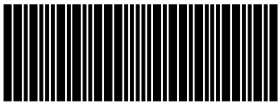
6543210

Code 93



123456-9$

Code 2 of 5



123456

RSS-14

(01)00123456789012

EAN•UCC Composite
Symbology with RSS Limited

(01)12345678901231(10)123456789(11)001205(3202)001234

Programming Chart

This programming chart contains alphanumeric bar codes used for setting additional programming options, such as the digits representing Symbology Message Length. Scan the programming selection bar code first, and then scan the bar code(s) representing the option you want to set.

0

1

2

3

4

5

6

7

8

9

Programming Chart

A

B

C

D

E

F

Save

Discard Current Changes

4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187

38/5770/SM Rev A